With so many year 2000 tools out there, finding the right one is the challenge. Page 67

CLOSER LOOK **Exclusive:** A first look at Microsoft's stab at melding Windows 95 and browser interfaces. Page 41

COMPUTERWORLD

The Newsweekly for Information Technology Leaders
News updates, features, forums: www.computerworld.com
January 6, 1997 · Vol. 31 · No. 1 · 132 pages · $3/Copy $48/Year

YEAR 2000 REMEDIES

If it sounds too good . . .

▸ Is Cobol crash course a quick fix?

By Julia King

FORGET ABOUT GOING back to college or signing up for months of formal training.

Three weeks and $350 is all it takes for a novice to learn Cobol, according to the creator of a new study-at-home course specifically designed to help ease the year 2000 skills crunch.

The extent to which the course can assist with year 2000 work is the subject of much debate.

Someone with "zero experience with programming" could easily learn Cobol by the end of the course, said Mo Budlong, author of *Teach Yourself*

Cobol course, page 95

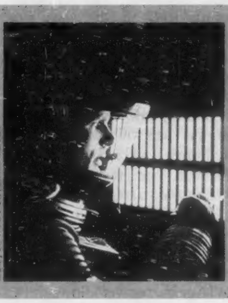
▸ Silver bullet pitched, dissed

By Thomas Hoffman

A SMALL CALIFORNIA developer claims it can analyze all your Cobol source code, automatically insert four-digit fixes to two-digit date fields and convert millions of lines of customized code in a matter of weeks for 50 cents per line.

Industry experts place the average cost of converting date-sensitive code in the range of $1.10 to $1.60 per line. That would make MatriDigm Corp.'s pricing model very attractive "if they can truly do turnkey operations," said Bill Wachel, a senior manager at the Dallas office of The Green-

MatriDigm, page 16



MGM/UA HOME ENTERTAINMENT

By Mitch Wagner **Next week** in Urbana, Ill., a computer named **HAL 9000** will be activated for the first time. When Arthur C. Clarke and Stanley Kubrick created *2001: A Space Odyssey* roughly **three decades ago**, they picked a date for HAL's activation that was so far off as to be almost unimaginable: **Jan. 12, 1997.**

In Depth, page 70

DOD on red alert to fend off info attacks

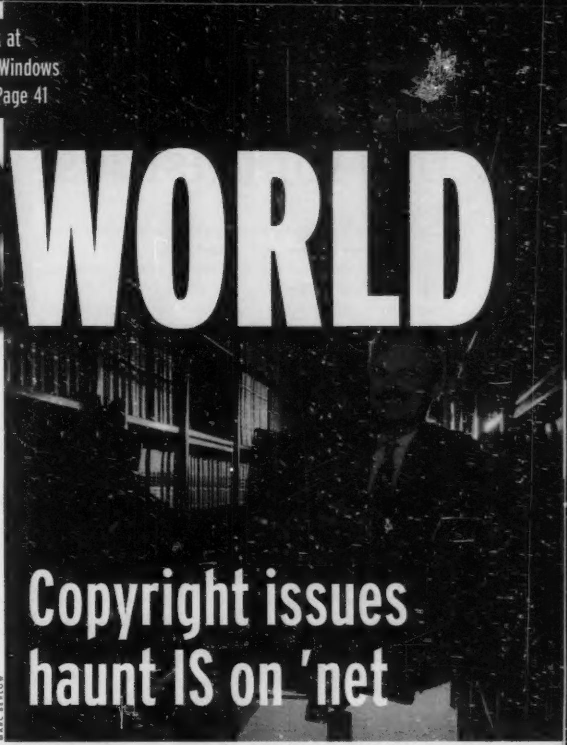
By Gary H. Anthes
WASHINGTON

INCREASINGLY worried about threats to the nation's information infrastructure, the U.S. Department of Defense is likely to establish a "red team" of security experts charged with attacking U.S. computer and communications systems to assess their security.

An unpublished report by the Defense Science Board's Task Force on Information Warfare, portions of which were obtained by *Computerworld*, recommends that the Pentagon spend $3 billion in additional funds over the next five years to find ways to reduce the vulnerability of U.S. systems to attacks from terrorists, unfriendly states — and the odd hacker.

In addition to the special security force, the board also recommends establishing a threat-assessment and warning center at the National Security Agency and an attack assessment, emergency response and recovery capability at the Defense Information Systems Agency.

Security, page 16



Copyright issues haunt IS on 'net

MARC BERLOW

Online poaching worries users, while "confusion reigns" about legal limits, says Tom Smedinghoff, a Chicago lawyer

By Kim S. Nash

HUMOR WRITER Dave Barry stopped posting his weekly missives on the Internet last year because they were so widely copied illegally that the columns were losing their value.

ONLINE LEGAL ISSUES

First in an occasional series

Although clear copyright labels adorned Barry's articles, users pointed, clicked and snipped them to shreds. So the wiseguy writer vacated the World Wide Web, sparking concern in some quarters about the shakiness of copyright protection online.

Meanwhile, a suit brought by the Church of Scientology against Internet access provider Netcom On-line Communication Services, Inc. presented another hot copyright issue: Are Internet companies liable for any infringement their customers might perform?

Information systems managers must deal with the copyright monster in two ways. Not only must they help shield their companies' copyrighted work from infringers, but they must also teach end users how to treat protected material they find on the Internet.

It is a tough job, and the flux in copyright law is making it tougher.

Whether to revise copyright

Copyright, page 28

UP FRONT

Bad for business

When it comes to the computer industry, the government, as usual, just doesn't get it.

The Commerce Department — that same agency whose goodwill single-handedly destroyed the U.S. flat-panel display market — announced rules on encryption last week that were supposed to address user and industry concerns about overly zealous regulations. But the rules still require users to let the government snoop in their files. It's a bad law, and it will cripple the ability of U.S. firms to conduct electronic commerce internationally.

The rules do offer some modest concessions. Encryption products would no longer be afforded the same export status as Uzi machine guns. They'd be treated more like exotic plants. But the requirement that users give encryption keys to a trusted third party undermines the whole value of encrypted communications. Who's going to have access to the keys? The FBI? Maybe former Olympic Park bombing suspect Richard Jewell can offer a testimonial. Never has faith in government law enforcement been lower. Never has there been a worse time to expand its powers.

The proposal reflects a basic misunderstanding of the Internet

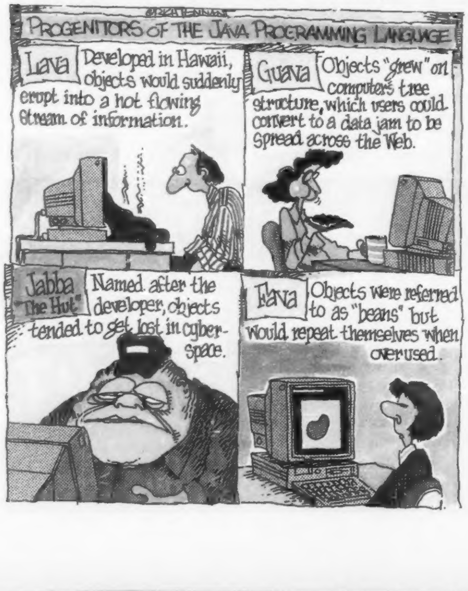
Commerce's proposal reflects a basic misunderstanding of the ways of the Internet. It's a desperate effort to regulate something that inherently can't be regulated. U.S. companies won't be able to sell or use encryption products overseas if foreign partners know the Feds have a key.

The rules could permit a less-restrictive country to emerge as an international clearinghouse for encrypted communications. Anyone who wants to skirt the law can use one of several good encryption products already available on the Internet.

The government rules are a trip wire at the starting line of the electronic commerce race. They should be withdrawn.

Paul Gillin, *Editor*
Internet: *paul_gillin@cw.com*

THE FIFTH WAVE
BY RICH TENNANT


©RICH TENNANT
PROGENITORS OF THE JAVA PROGRAMMING LANGUAGE
Lava
Developed in Hawaii, objects would suddenly erupt into a hot flowing stream of information.
Guava
Objects "grew" on computer's tree structure, which users could convert to a data jam to be spread across the Web.
Jabba "The Hut"
Named after the developer, objects tended to get lost in cyberspace.
Fava
Objects were referred to as "beans" but would repeat themselves when overused.

Couriers deliver new 'net services

▸ *Online package-tracking systems save companies money and open doors for their customers*

By Thomas Hoffman and Kim S. Nash

THE SIMPLE package-tracking services that made FedEx and other carriers the talk of the Internet town six months ago are nothing compared with the carriers' plans for 1997.

Rivals such as Federal Express Corp. and United Parcel Service, Inc. are building workhorse applications for the World Wide Web that, in some cases, are leading their customers into lines of business that wouldn't have been feasible otherwise.

A prime example of how far the shippers will go for market share is FedEx customer Monorail, Inc., an Atlanta start-up that sells PCs that cost less than $1,000. Monorail's business model relies on FedEx's online logistics services.

Monorail pays FedEx to manage its ordering and delivery of PCs. The systems were designed to fit inside FedEx's 19-by 19-in. standard cardboard box. The orders are made over FedEx's proprietary networks, but an Internet version is in the works for this year.

NO MIDDLEMEN

The deal means Monorail skirts middlemen distributors and doesn't have to keep inventory. Dave Hocker, a Monorail co-founder, declined to detail the savings but said the company wouldn't be in business without that kind of arrangement.

"We started the company with a business model rather than a product. The notion of using FedEx was integral," Hocker said.

Monorail is eager to see FedEx move those services to the Internet. "We dream of the day when a dealer doesn't have to call FedEx but can just send an E-mail," Hocker said.

FedEx also claims to be the only delivery company to let customers prepare shipping documents and request pickup via the Internet. At FedEx's Web site (www.fedex.com), customers can fill in shipping data on a Hypertext Markup Language form and print it, along with a freshly generated bar code, on a local laser printer. They can then send electronic mail to a courier to schedule pickup.

TERRY CLARK

The Internet is "a means of providing sophisticated services to small customers that we already provide to large customers," says RPS' Bram Johnson

Internet services are also helping package carriers slash support costs.

Having launched its interactive Web site in May 1995 (www.ups.com), UPS now handles 30,000 online tracking requests daily, said Rakesh Sapra, manager of interactive marketing at UPS. Because it costs the Atlanta-based carrier $1 for every tracking request handled through its toll-free voice service, UPS figures the Web service saves $4 million to $6 million per year in tracking costs alone, said Tom Hoffmann, Web site manager at UPS.

RAPID RETURN

That's a pretty good return on the $4 million that UPS has socked into its Sun Microsystems, Inc. Web hardware, software and personnel since it launched its first static site three years ago.

Other UPS Web applications include a time-in-transit calculator and a drop-off locator, which lets users plug in a ZIP code to locate drop-off locations.

But a smaller delivery firm, RPS, Inc. — formerly Roadway Package System — in Pittsburgh, may have the lead in innovation.

Besides having online package tracking (www.shiprps.com), RPS in the next few months plans to introduce "prealerts" on the Web for cash-on-delivery packages. RPS will notify customers via Internet mail regarding how much an incoming package will cost at delivery and when it will arrive, said Bram Johnson, vice president of marketing and strategic planning.

"We think the Internet is life — it's a means of providing sophisticated services to small customers that we already provide to large customers" through PC software-based logistics services, Johnson said.

Today, 30% of RPS' sales are from proprietary and Internet electronic data interchange services. Three years ago, those sales totaled less than 2%, Johnson said.

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- **SAP STARS: STILL SITTIN' PRETTY.** The window of opportunity for SAP consultants may be closing, but those who jumped on the bandwagon early can look forward to a busy and lucrative future. Veteran consultant Robert Parkinson discusses the SAP outlook for '97 and beyond. (www.computerworld.com/careers)
- **COPYRIGHT CONTROVERSY.** Whether to rewrite copyright laws for the online realm is a serious question — and the Clinton administration, Internet service providers, content creators, user groups and other interested parties all have answers. The catch is that none of them matches. (www.computerworld.com)

Don't call it a safety 'net

▸ *Most Web sites are vulnerable to attack*

By Gary H. Anthes

NEARLY TWO-THIRDS of the most popular commercial and government Internet sites are wide open to abuse by hackers, according to a recent probe of major World Wide Web sites by security expert Dan Farmer.

Farmer's findings were borne out last week when one or more hackers penetrated the U.S. Air Force's main Web site — www.af.mil — and defaced the home page with bloody images and obscene pictures.

WEB SITES PROBED BY SATAN

Type of site	Number of hosts	Percent vulnerable
Banks	660	68%
Credit unions	274	51%
U.S. government	47	62%
Newspapers	312	70%
Sex services	451	66%
Total	1,744	65%

Source: Dan Farmer, independent consultant, Berkeley, Calif.

It was the third high-profile penetration of government Web sites in recent months. The other two were the U.S. Department of Justice and the Central Intelligence Agency.

Farmer, co-developer of the controversial Security Analysis Tool for Auditing Networks (SATAN), used SATAN to surreptitiously probe 1,734 Web sites for security flaws. These might include bugs and limitations in Unix utilities such as file transfer protocol, sendmail and the Network File System.

FINDING GAPS

SATAN is an "attack scanner," one of a handful of software packages that probe networks of Unix computers searching for security flaws. It reports back information about poorly configured network services and bugs in system or network utilities. It can be a valuable diagnostic tool, but its use is condemned by some who see it as just another hacker's aid.

Farmer said few sites appeared to detect the probes. "Only three sites contacted me to inquire what was going on when I performed the unauthorized survey," he said in a post to his Web site, www.trouble.org. "They were initially suspicious, fearing a failed attack, but they calmed down after I apologized for the infraction."

Farmer said he didn't exploit the security flaws to actually break in to the Web sites. "It seems obvious from these findings that security and system administration are very difficult to perform effectively and that the latent problems of securing a host or site are ill-understood," Farmer said in his report.

But Peter Tippett, president of the National Computer Security Association (www.ncsa.com) in Carlisle, Pa., disagreed with that bleak assessment. "It's not easy to break in to a site if the basics are done well," he said.

Farmer and Tippett are both right, said William H. Murray, an information security consultant for Deloitte & Touche. If administrators follow a few basic principles, such as not loading a host with multiple applications and services, security can be ensured fairly easily. But most Unix administrators load up applications on machines, making security difficult, he said.

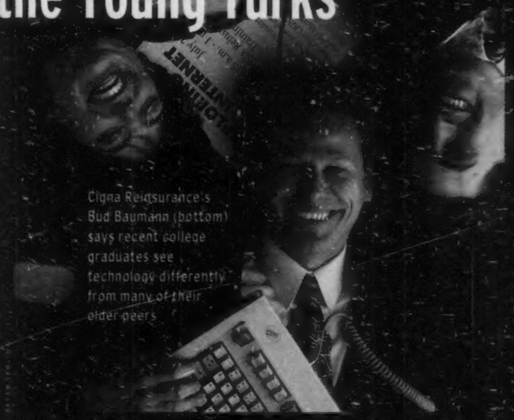
Eugene Spafford, a Purdue University professor who specializes in computer security, said commercial interests are devoting much effort to securing transactions over the 'net via encryption but often ignore security on the PCs that send and receive the encrypted data.

An Air Force spokesman said last week that the break-in is being investigated by several agencies. "No computer hacker moves without leaving footprints," he said. "We are going to find the person who did it."

"The Air Force has had some of the best security people, and they know their sites are targets," Spafford said. "So if they are getting hacked in to, that should give second thoughts to people deciding to bet their company's future on the Web."

Attack of the Young Turks

By Alice LaPlante Bud Baumann is getting used to it.



Cigna Reinsurance's Bud Baumann (bottom) says recent college graduates see technology differently from many of their older peers

As division information officer at Cigna Reinsurance in Bloomfield, Conn., he knows that recently hired college graduates display a dramatically different attitude toward technology than did previous generations of Cigna employees. On their first day on the job, they're more likely to make a beeline for the webmaster than the coffee machine. They'll demand immediate access to electronic mail and the Internet. And that's just the beginning.

"It doesn't matter whether they have a liberal arts or business background. They've been using word processors and spreadsheets for years. Many of them even designed their own Web home pages in college," Baumann says.

And it isn't only college graduates who have this techno-savvy attitude.

New blue-collar workers at Public Service Electric & Gas Co. in Newark, N.J., come in with impressive computer skills, says Ralph LaRossa, manager of

The Next Generation, page 61

Encryption conniption

▸ *Users: New regulations may hinder commerce*

By Barb Cole

USERS DECRIED regulations published last week that change the way encrypted software is treated by the government and said the rules could be a stumbling block to building Internet commerce applications.

U.S. software companies and privacy advocates are now expected to turn their sights toward congressional leaders in hopes of persuading them to introduce remedial legislation.

The regulations were designed to let developers export more powerful encryption technology, but there is a catch. The law will require users to make encryption keys available to law enforcement in case it is needed to decode the communications.

The ruling was issued last week by the U.S. Department of Commerce's Bureau of Export Administration. It reclassifies encryption products, removing them from munitions and placing them on the Commerce Control List. As a result, oversight for encryption software has shifted from the State Department to the Commerce Department, which is generally seen as more supportive of U.S. business concerns.

Several software industry groups, including the Business Software Alliance, also loudly contested the regulation, claiming it limits their members' ability to sell encrypted software in international markets.

SECURITY REGULATIONS

THIRD PARTY AT ISSUE

User groups, including the Electronic Messaging Association (EMA), are also deflated.

"We are disappointed [with the regulation] because it doesn't seem to reflect our suggestions," said Victor Parra, president and CEO of the Arlington, Va.-based EMA, which has more than 550 members. The EMA tried to convince the administration that the holder of the key should be an employee of the user company. The regulation describes that person as a trusted third-party agent.

"The user community doesn't think anybody in a third party [can be] a trusted agent," Parra said.

In addition, some companies could be forced to limit their encrypted E-mail and Internet commerce transactions to domestic firms because their international trading partners will be uneasy knowing that a third party holds the encryption key, users said.

The EMA also termed as unreasonable the requirement that companies turn over encryption keys within two hours of receiving a request.

Users seem chiefly concerned that the regulations may interfere with software makers' ability to deliver encryption software and could affect the price. "If the regulation isn't acceptable to the software industry, they won't comply, and we won't have the tools we need to communicate with global trading partners," said Durwin Sharp, electronic commerce adviser at Exxon Corp. in Houston.

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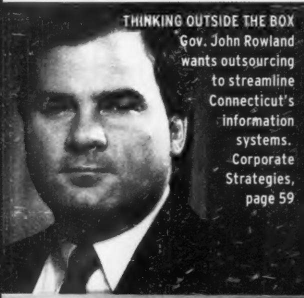
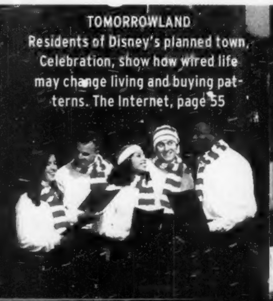
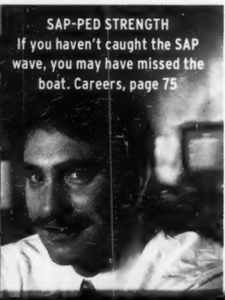
NEWS



THINKING OUTSIDE THE BOX
Gov. John Rowland wants outsourcing to streamline Connecticut's information systems. Corporate Strategies, page 59



TOMORROWLAND
Residents of Disney's planned town, Celebration, show how wired life may change living and buying patterns. The Internet, page 55



SAP-PED STRENGTH
If you haven't caught the SAP wave, you may have missed the boat. Careers, page 75

Fending off the 'query from hell'

▸ *Complex queries bog down data warehouses*

By Craig Stedman

INFORMATION SYSTEMS managers are discovering a hard truth about data warehouses: Building one is tough enough, but what's really difficult is keeping it humming once users start firing queries.

The problem, according to managers with warehousing experience, is that the pools of historical data demand constant vigilance and fine-tuning as business needs change and the volume of data and end users grows. Otherwise, summary tables, indexes and prejoins that are supposed to speed up query response can quickly become outdated.

When that happens, complex user-written queries can go off in unanticipated directions that bypass all the built-in performance boosters. That situation — known fondly as "the query from hell" — stifles throughput and leaves end users waiting in frustration for answers to their questions.

"We started off with the queries from hell, and we learned our lessons," said Charles Nettles, director of technology at the Information Technologies division of McKesson Corp. in San Francisco. The pharmaceuticals distributor now monitors ad hoc querying closely and uses software routines to block long queries and reschedule them as off-hours batch jobs, he said.

RAY NG

MCI's Chris Courim: "You can schlep a lot of data into a data mart pretty easily"

COMMON PROBLEM

The difficulty of keeping things from bogging down "is the most frequent complaint I hear" about data warehouses and their smaller data mart brethren, said Alan Paller, director of research and education at The Data Warehousing Institute in Bethesda, Md.

That degree of difficulty is driven upward by rapid growth in the number of end users who have access to a warehouse, Paller said. At 115 warehousing sites surveyed by the institute in 1996, the average number of users jumped from 16 at the outset to 44 within six months, 99 after a year and 255 after two years, he said.

To avoid surprises, warehousing managers must keep close tabs on the business issues facing end users so that most queries can be predicted and planned for in advance, Nettles and others said. Then comes the drudge work of revamping the guts of a warehouse as needs change.

To avoid some of the need for constant upkeep, the Texas Department of Public Safety's traffic law enforcement division in Austin wrote software that maps wayward queries to appropriate indexes in its data warehouse. But Larry Joseph, a consultant who led the project, cautioned that doing so added a big upfront burden: Designing and building the 80G-byte warehouse required 7.5 person-years of work and took 30 months to complete.

On an ongoing basis, all the summarization, indexing and prejoins can increase the time needed to feed new data into a warehouse, said Wayne Eckerson, an analyst at Patricia Seybold Group in Boston. But warehousing managers face ever-smaller load windows [CW, Nov. 25].

Such complications can make maintaining a warehouse an ordeal, said Chris Courim, manager of systems development for business operations at MCI Communications Corp.'s mass-markets unit in Denver. He runs a 60G-byte data mart on Sybase, Inc.'s Sybase IQ database.

"You can schlep a lot of data into a data mart pretty easily," Courim said. "But once users get in and have a chance to swim around, that can only generate more [work]. It's a living and breathing thing, and it kind of never dies."

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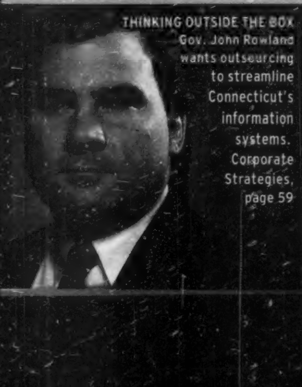

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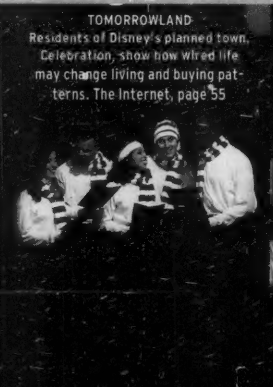

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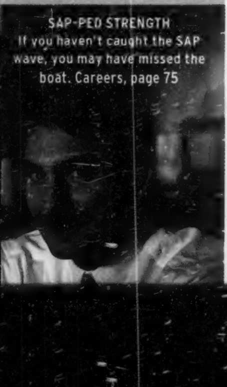

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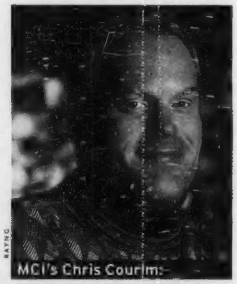

RAYNG

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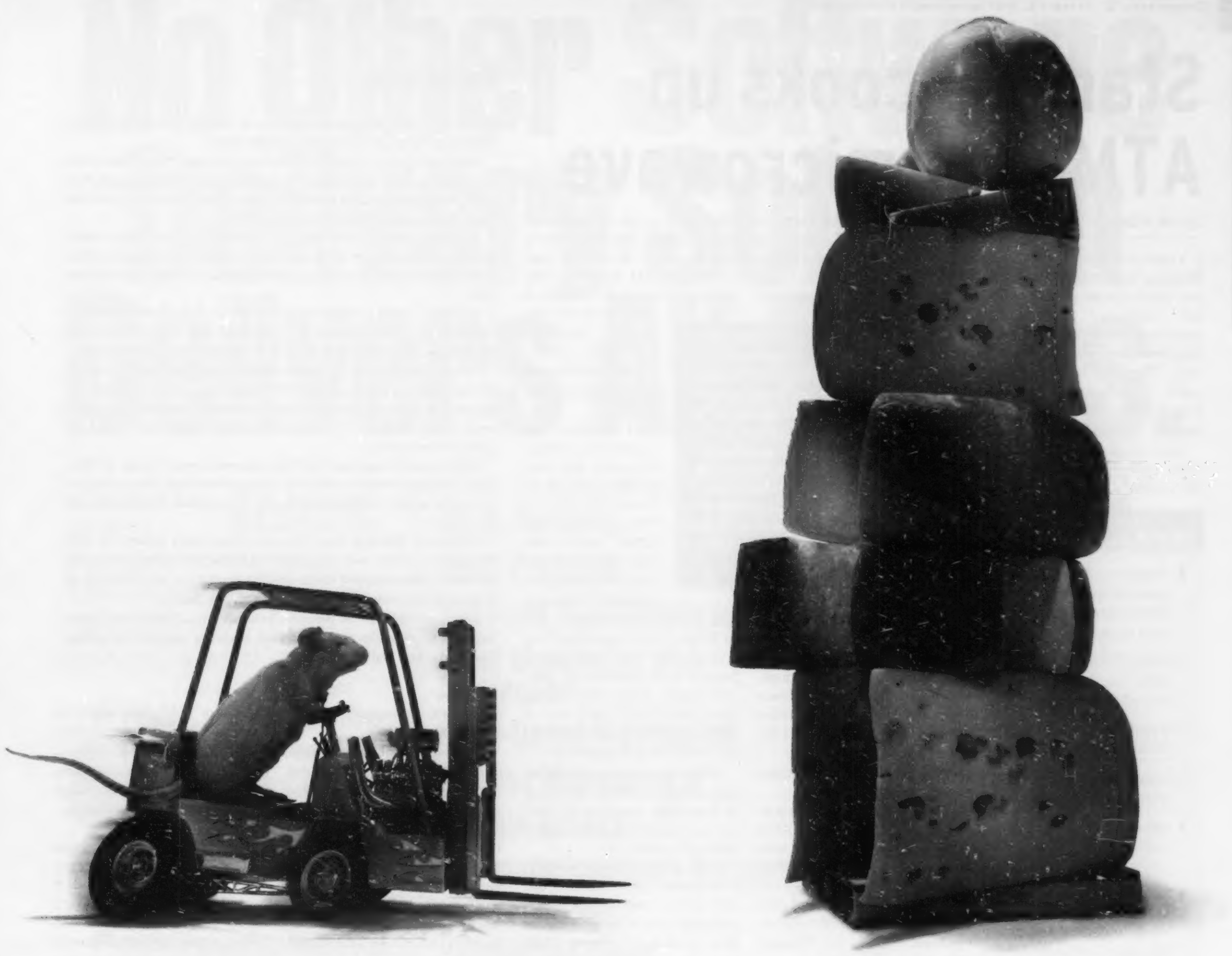

Start-up cooks up ATM over microwave

By Bob Wallace

A START-UP backed by Cisco Systems, Inc., AT&T Ventures and other companies this week will announce networking equipment that for the first time lets users send Asynchronous Transfer Mode (ATM) traffic over microwave radio links, *Computerworld* has learned.

Netro Corp. in Santa Clara, Calif., has developed devices that enable users to connect sites up to five miles apart for high-speed data, video and voice transmission without the hassle of laying cable.

That is especially important in big cities, where it is often impossible to dig to install cable. Users need only install pizza-size microwave dishes atop their buildings and sign up with a radio frequency service provider for the bandwidth to form the wireless link.

NETRO
SANTA CLARA, CALIF.

- **Products:** Special antenna optimized for ATM transmission and access devices
- **Speed supported:** 1M bit/sec. now; 45M bit/sec. later this year
- **Spectrum used:** 38-GHz band
- **Management:** SNMP-manageable
- **Other wares:** Plans to have card for use in a Cisco ATM FRAD
- **Investors:** Cisco, AT&T Ventures, Norwest Venture Capital and Newbury Ventures

There's big interest in running ATM over microwave links. In fact, the ATM Forum, an association of more than 800 vendors, has already created a wireless ATM unit to explore the area.

ROADBLOCKS

But there are potential stumbling blocks as well. To establish a microwave link, users must have a direct line-of-sight path between locations, which can be difficult because trees and tall buildings often stand in the way. And there's the five-mile limitation.

ATM users are excited about Netro's efforts.

"This represents an important step in boosting use of ATM in the wide area because it uses long tried-and-true microwave technology," said Bill Horst, chief of the U.S. General Services Administration's communications branch in Philadelphia, which uses ATM.

"This will enable sites that don't have access to buried cable, or where burying cable is too expensive, to still be connected to ATM backbone networks. I'd expect ATM users to implement this approach quickly," Horst said.

Other ATM users were equally enthusiastic.

"I see this as having strong potential for users that have a fiber-optic backbone network but have a site two miles away that they need to tie in," said John Boyd, former chief technologist at Northeast Utilities, Inc. in Berlin, Conn., and now an executive at the company's Mode/1 Communications unit. "It's much easier than wiring those few miles. And lots of ATM users have been looking for a more flexible approach."

About 500 to 1,000 large organizations use ATM, according to Tom Nolle, president of CIMI Corp., a consulting and research firm in Voorhees, N.J.

One user concern is whether corporations that already use microwave systems for other purposes can affordably tweak them to support wireless ATM. "It'd be far less attractive if users had to buy separate equipment just to support ATM," Horst said.

A Netro spokesman confirmed plans to introduce the company and products this week but wouldn't give details.

TRICKY TRANSMISSION

To date, ATM traffic has run over cable because wireless is a noisy medium that sometimes loses information during transmission and can be interrupted by rain or snow.

"If an ATM cell was dropped, the entire WAN link would be corrupted or lost," one source said. "What Netro has done is develop an error-correction scheme and [dish] technology that eliminates microwave's performance problems."

The Netro products use the 38-GHz radio frequency band, which is good and bad. It is good because the band is very lightly used, but it can be bad because the higher frequency means shorter transmission distances.

More on the air

Netro isn't the only vendor looking to heat up the 38-GHz radio frequency band using microwave technology.

Another start-up, WinStar Communications, Inc. in New York, has snatched up radio frequency licenses that will let the company offer microwave links at speeds of up to 45M bit/sec. in more than three dozen cities in the next few years.

WinStar, which already offers microwave services in New York, provides all the pieces of the system for users — the small, rooftop microwave dishes and the spectrum needed to create the wireless link.

Although many carriers have focused on lower frequencies because they support longer-distance links, few have entered the 38-GHz band because it supports links of up to five miles at best.

"That's obviously not enough reach to link far-flung offices, but it's an excellent approach to link campus networks in a metropolitan area or to bypass your local carrier to reach a long-distance network," said Daniel Briere, president of TeleChoice, Inc., a consultancy in Verona, N.J.

Bell Atlantic Corp. was the first big-time carrier backer of WinStar. The two companies recently agreed to connect their networks in several of the states served by the regional Bell holding company.

WinStar's Wireless Fiber Service offers users speeds of 45M bit/sec. — usually only supported on fiber-optic cable — over the airwaves. The company holds 38-GHz licenses in 41 of the top 45 U.S. markets, covering more than 110 million people.

Upon completion of pending acquisitions, WinStar will have licenses in 46 of the top 50 markets, covering roughly 170 million people. — Bob Wallace

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Spyglass seeks peek at Microsoft books in royalties dispute

▸ *Audit to determine licensing payments to Spyglass for Internet Explorer browser software*

By Justin Hibbard

SPYGLASS, INC. last week said it will audit Microsoft Corp.'s records to determine whether Microsoft has paid royalties it owes for distributing licensed Spyglass software used in Microsoft's Internet Explorer browser.

Spyglass officials said the company doesn't expect to recognize any revenue from Microsoft during the first fiscal quarter, ended Dec. 31, 1996, except for the $400,000 minimum quarterly payment due under the companies' license agreement.

Analysts familiar with the agreement estimated that in addition to the $400,000 minimum payment, Microsoft is required to pay Spyglass an additional 40 to 50 cents in royalties for each unit shipped.

WAITING FOR REPORT

Spyglass officials said the company can't determine the amount of royalties Microsoft owes because Microsoft hasn't filed a royalty report stating the number of Internet Explorer browsers it has shipped.

Spyglass also announced that it expects to report revenue of about $4 million and a loss ranging from 10 to 13 cents per share for the quarter. Those figures fall below analysts' expectations.

"The shortfall is going to come directly from that license — the amount Microsoft was going to pay them," said Dawn Simon, an analyst at Advest, Inc. in Boston.

Spyglass also announced that it expects to report revenue of about $4 million and a loss ranging from 10 to 13 cents per share for the quarter. Those figures fall below analysts' expectations.

Simon had estimated that Spyglass would report $6 million in revenue and a loss of 2 cents per share for the quarter. Spyglass could have earned a maximum of $1.5 million from Microsoft during the quarter, she said.

"The difference between $400,000 and $1.5 million is almost pocket change to Microsoft. So I'm not sure Microsoft understood the impact on Spyglass," Simon said.

But even if Microsoft had paid Spyglass $1.5 million, Spyglass' revenue for the quarter still would have missed Simon's forecast by $500,000.

NUMBERS IN DISPUTE

A spokeswoman for Microsoft said the company hasn't yet determined how many browsers it shipped last quarter. A Spyglass spokesman said Microsoft has provided a preliminary estimate, and Spyglass disputes the numbers.

The Microsoft spokeswoman said Microsoft has already paid "several million dollars" in advance royalties to Spyglass, and Microsoft believes it is "several million dollars ahead" on its royalty payments.

Officials at both companies weren't available to comment.

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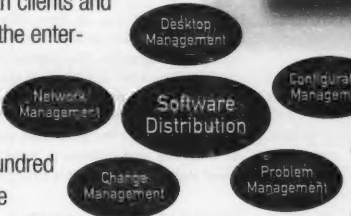

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Lotus pressed for richer Web tools

By Barb Cole

ALTHOUGH THEY won't be as steamed as in years past, users will still have some bones to pick with Lotus Development Corp. at Lotusphere 97 later this month.

Users will be pushing Lotus for richer World Wide Web development tools and a clearer picture of the company's long-term client strategy.

But the mood at Lotusphere, which starts Jan. 25 in Orlando, Fla., is expected to be upbeat compared with last year's conference, which focused on the long-awaited migration from Notes Release 3 to Release 4.

SOFTWARE NEEDS

Lotus has created a lot of momentum around its Domino Web server. Now it must continue to improve the software so business partners and large companies can easily build Domino-based Web applications, users said.

"Domino [4.5] is a good Web development environment now, but it needs work," said Ken Norland, a consultant at Ernst & Young, which just completed its worldwide Notes rollout.

Overall, Lotus has done the job this year, said Michael McGhee, director of administrative computing at the University of Nevada in Las Vegas, which has a campuswide Notes license.

The chief issue for most users is that key features of Domino aren't supported by Web browsers. That means developers can't write one application to work for a mix of Notes clients and browsers. It also makes it hard to port existing Notes applications to the Web environment, users said.

"To create Web apps today around Domino, you need several sets of expertise," said David Marshak, a vice president at Patricia Seybold Group in Boston: the LotusScript development language, Hypertext Markup Language and possibly Java. Marshak said attendees will be looking for a sense of "how aggressive Lotus will be at filling in the pieces that Notes clients can do but browsers can't."

"The next step [for Lotus] is providing more Notes functions to the Web world," said Motti Goldberg, chief architect at US West Communications, Inc. in Denver, which has 15,000 Notes seats and is deploying Domino as the platform for a set of customer service applications.

Lotus officials are expected to talk more at the conference about plans to support Java and roll out a Java class library for accessing Domino back-end services.

The company is also building a set of Java applets, expected to start rolling out this year, that will give browsers Notes-like features.

And last fall, the company introduced its Weblicator software, which adds Notes-like replication to browsers.

QUESTIONS ABOUT FUTURE

Those developments will help level the playing field between browsers and Notes clients, users said. But "we need to know how [this] will affect the long-term plans for the [Notes] client," McGhee said.

Lotus officials insisted that the Notes client is alive and well and pointed out that the company sold a record-breaking number of Notes client licenses last year.

Well-entrenched Notes shops will give Lotus a long wish list, but the toughest audience the company will face at the conference could be Web developers who are eyeing Domino but don't have a Notes infrastructure.

"To sell this group, Lotus needs to make Domino adhere to enough Internet standards that you can stick it next to a Web server, and end users won't know the difference," said Tim Sloane, an analyst at Aberdeen Group, Inc., a market research firm in Boston.

Those Web-focused developers would also like to hear that they can use standard Web tools to manage Domino, Sloane said.

Users want:	Lotus plans to:
A richer Web development environment	Deliver a Java Class Library for accessing Domino back-end services
More support for Notes-like features from a browser	Roll out Java applets that let browsers render Notes user-interface features

Off-balance load

Lotus' struggles to bring its once-proprietary messaging software to the Web aren't limited to the client side.

Domino Advanced Services, a server add-on designed to handle traffic spikes on Domino servers, can't do load balancing when Web browser clients access it, the company confirmed.

Load balancing, which can route traffic to alternate servers at peak times, is supported with Notes clients.

The $1,000 server add-on was announced in October and is aimed at making Domino servers more scalable by adding clustering support and partitioning features. The software was originally designed to work with earlier versions of Notes.

It is ironic that Domino Advanced Services was billed as an aid to help manage active server sites, yet it isn't fully functional with browser clients, said Michael McGhee, director of administrative computing at the University of Nevada at Las Vegas, a large Domino site.

Lotus officials said the company will add load balancing for Web browser clients in a future release of Domino Advanced Services, but they declined to specify when. — Barb Cole

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SHORTS

Encryption transition

The National Institute of Standards and Technology (NIST) in Gaithersburg, Md., last week published draft requirements for a federal encryption standard. Based on an advanced encryption algorithm, the standard would replace the Data Encryption Standard (DES) algorithm. Because of the huge installed base of DES-based hardware and software, NIST officials said, changing standards would require "a multiyear transition."

Online data mart forum

The Data Warehousing Institute in Bethesda, Md., is setting up an online discussion forum for information systems managers who are building or running data warehouses and data marts for companies in the health care industry. Other industry-specific forums will follow shortly, the institute said. Institute members can subscribe by sending electronic mail to tdwi@clark.net.

A switch for Intel

Intel Corp. plans this week to enter the 10M/100M bit/sec. switch market, sources briefed by the vendor said. The switches, to cost about $600 per port, support existing 10M bit/sec. connections now and will support 100M bit/sec. links when needed. Bay Networks, Inc. recently detailed plans for a similar switch due in the first quarter at a price of $250 per port.

Sahara bought for $212M

Network switch provider Cascade Communications Corp. in Westford, Mass., last week bought privately held Sahara Networks, Inc. for $212.8 million. Sahara, in Wallingford, Conn., is a developer of high-speed broadband access products. With Sahara's products, Cascade will offer carriers the option of providing high-speed voice, video and data applications on public Asynchronous Transfer Mode networks.

Fast modems pass test

U.S. Robotics Corp.'s 56K bit/sec. modem, the X2, is due to reach the market by the end of the month, the Skokie, Ill., company said last week. The modem has been tested in 87 area codes in the U.S. In a "high percentage" of those tests, the company recorded only one analog-to-digital conversion. Additional conversions reduce modem speed. U.S. Robotics declined to provide a specific percentage. U.S. Robotics, which is expected to be the first to market with the 56K bit/sec. modem, hasn't announced pricing.

HP ships PC servers

Hewlett-Packard Co. in Palo Alto, Calif., plans to announce a new low-end PC server aimed at small and midsize workgroups. The NetServer LD Pro will be Pentium Pro-based and features 512M bytes of system memory, hot-swappable disk drives and up to 27G bytes of storage. The NetServer LD Pro Model 1 with a 180-MHz Pentium Pro processor and 32M bytes of Error Checking and Correcting RAM is expected to be priced starting at $3,399. It is shipping now.

Standardizing Java

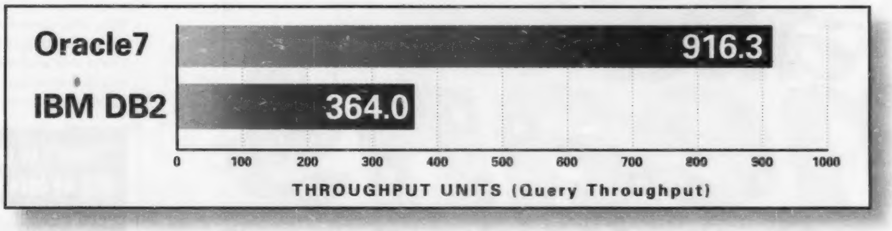
In a move to standardize the Java language, a group of software companies will meet with the International Standards Organization (ISO) this week. Sun Microsystems, Inc. will host the meeting at its Cupertino, Calif., headquarters at the behest of the ISO, said Lisa Poulson, a spokeswoman for JavaSoft. The meeting is an early step in Sun's move to relinquish some control of its increasingly popular Java technology.

SHORT TAKE Bell Atlantic Nynex Mobile recently announced it has acquired the North Carolina 4 Cellular Limited Partnership's Rural Service Area 4 cellular business for an undisclosed amount.

Oracle7 Parallel Server: Almost 3 Times Faster than IBM DB2/Parallel Edition

The TPC-D is the industry standard benchmark for measuring query performance on large complex databases. On the fastest hardware that IBM makes, the RS/6000 SP, running against an identical 300 GB data warehouse, Oracle7 Parallel Server's TPC-D performance was almost twice as fast with almost three times the throughput as IBM's own DB2/Parallel Edition. What's even more amazing, Oracle delivered this performance at nearly one-third the price.

Almost 3 to 1 Faster Multi-user Throughput



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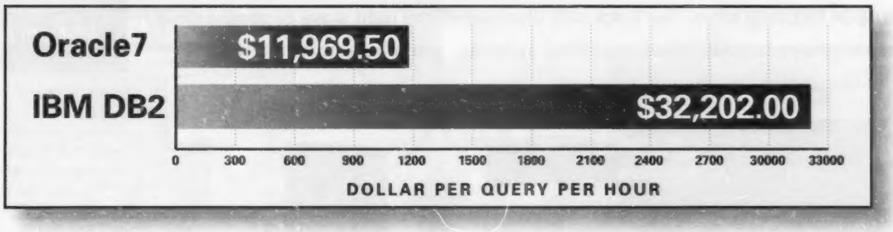

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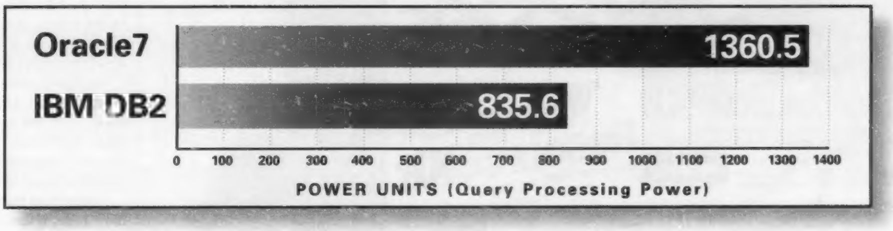

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Microsoft touts faster development, but users skeptical

By Sharon Gaudin

MICROSOFT CORP. is readying an integrated application development environment, but some corporate users are concerned it won't be flexible and powerful enough to keep up with their changing needs.

Microsoft is expected to unveil the environment, which was designed to let programmers use multiple languages and tools to build applications, at its Developer Days conference March 19, *Computerworld* has learned. Sources close to the firm have confirmed the plans, but Microsoft officials declined comment.

Analysts and developers said the environment — code-named Boston — could speed application development.

But corporate IS managers are more skeptical.

"Can that one environment do as good a job as the [environments] that are specialized for each language?" asked Chris Kwiecinksi, a senior systems developer at Nabisco, Inc. in Parsippany, N.J. "The tools we have now are tuned to what they do. If you tune them down to a common denominator, it's tough to have a great product."

Kwiecinksi said any integrated environment worth buying would have to be flexible enough to accommodate languages as they come along. "We work in a dynamic environment," he said. "If some new language comes out that's better than Java, how will that fit in? You put a lot of money into this environment, and you've got to be able to fit something new into it, or it's not worth it."

ONE DEVELOPER FOR ALL?

Developers often use three or more languages and tools, each with its own environment, to build one complex application. That means a developer must know several languages or work within a team. Users and analysts are looking for an integrated environment that will allow one developer to do it all.

> "There's so many applications that we have here, nobody is going to come up with the one environment for us."
>
> – Joe Crawley, American Airlines

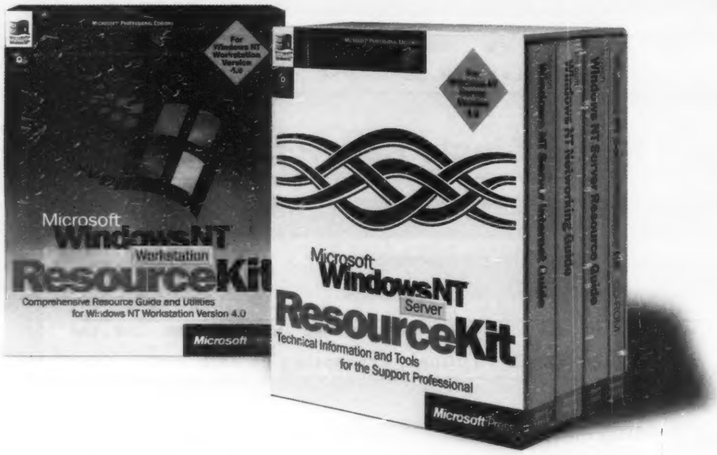
IBM's Visual Age family of development tools is close to what Microsoft is working on, said Karen Boucher, an analyst at The Standish Group International, Inc. in Dennis, Mass.

"I haven't seen [Microsoft's product], but it sounds like the Visual Age strategy," Boucher said. "It's slightly different because you choose a specific Visual Age tool for each different language. There isn't one for all the languages, like Microsoft is talking about. Developers generally love the idea of Visual Age so I imagine they'll love this concept."

Joe Crawley, director of online services at American Airlines in Fort Worth, Texas, said the carrier's 500-plus developers use a bevy of tools and languages, so any integrated environment would require a broad reach to meet his needs.

"There's so many applications that we have here, nobody is going to come up with the one environment for us," he said. "These open environment concepts have been around for a while. ... They work for certain kinds of applications and not for others. But maybe this could be the one that's different than all the rest."

Not everyone is as skeptical, though. Paul Mahowald, vice president of retail development at Blockbuster Entertainment Corp. in Fort Lauderdale, Fla., said that if the environment comes out as expected, it would be a tremendous advantage to him.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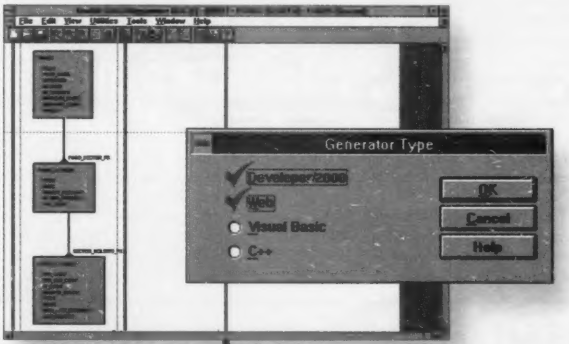
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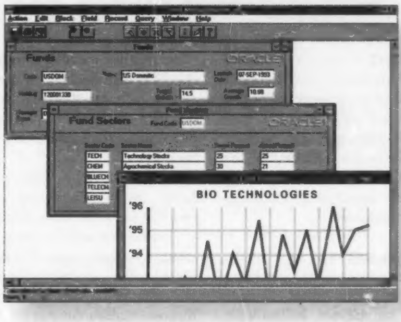
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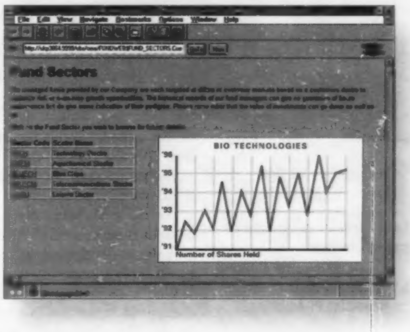
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Number of Shares Held

AS/400 shops say Windows connection needs work

By Tim Ouellette

IBM'S AS/400 MAY be known for its smooth integration of many applications, but users find that accessing the midrange system from Windows 95 isn't smooth enough.

Users complain that IBM's 32-bit connection software, Client Access/400 for Windows 95, hasn't performed consistently or reliably. More than a dozen users have complained in interviews and Internet discussion groups.

For example, one user in an AS/400 discussion group called Client Access an amateur attempt at a Windows 95 application. He urged IBM to "start over from scratch" and produce the kind of reliable product AS/400 users have come to expect.

Giving users smooth access to the AS/400 from Windows clients is important to IBM because the company wants to make the AS/400 a mainstream, day-to-day server for Windows users.

"If the AS/400 is supposed to be the best server out there, then without an integrated, supported way to attach to the box, they may have some problems," said Tom Murray, a partner at D. H. Andrews Group, a consulting firm in Cheshire, Conn.

IBM said it is upgrading the product. The company also said AS/400 users are accustomed to a high level of reliability that is hard for PC products such as Client Access to match.

HIT LIST

User concerns include the following:

- Client Access installs several programs in the client's system memory, slowing performance and limiting the number of applications users can run.
- Poor SNA connections, the AS/400's traditional communications protocol.
- Slow development of a version of Client Access for Windows NT Workstation.

The problem of extra files in system memory affected performance so much that it forced loyal AS/400 users such as Glen Kerner to spend more money to get the job done.

"It is forcing us to go to a third-party vendor and buy another package when we have already bought [Client Access]," said Kerner, a systems analyst at Rampage Clothing Co. in Los Angeles.

IBM has been updating the Windows 95 package along the way to address some of those issues. And the company last week released Beta 5 of the Windows NT Workstation version.

IBM officials said the company will deliver a refresh of the Windows 95 client later this quarter. It will include better SNA performance.

At the same time, IBM said it will do the following:

- Ship Project Unity, software that lets users administer an AS/400 from a Windows 95 or Windows NT workstation.
- Add native support for Novell, Inc.'s IPX protocol in OS/400, so users can turn to networking options besides TCP/IP and SNA.

ACCESS, NOT REPLACE

Users want to access the AS/400 from Windows NT Workstations, but they don't want Windows NT Servers to replace the AS/400 because:

- The AS/400 is more integrated and costs less to administer
- AS/400 shops are used to an integrated approach to management, not Windows NT's component approach
- 62-bit AS/400s have functional advantages over Windows NT and provide a smoother migration path

Source: Aberdeen Group, Inc., Boston

Microsoft inks deal to give browsers access to mainframe, AS/400 data. Page 47

Upcoming Win 95 interface combines OS and browser

By April Jacobs

USERS OF Microsoft Corp.'s Windows 95 are enthusiastic about the new interface, code-named Web View and planned for the next version of the operating system.

Microsoft's Web View interface will include:

- → A single browser and operating system interface
- → A Web-enabled control panel for diagnosing PC problems

Microsoft will give users the option to move away from the current approach of having separate interfaces for typical office applications and Internet- or intranet-based applications. In essence, Web View is a combination of an operating system and World Wide Web browser interface.

Web View, which will be beta-tested in new versions of Windows 95 due this quarter, will let users toggle between desktop and Web applications.

But Web View is just an option, so end users can choose a non-Web View screen as well, according to Microsoft officials.

The feature set will be a combination of the features available in Internet Explorer and Windows 9x.

Mike Lingenfelter, assistant vice president of information systems at Interwest Bank in Oak Harbor, Wash., said he would consider using the interface for the more than 500 workstations he has running Windows 95 and NT.

He said the hybrid interface is attractive because his firm is looking at developing intranet-based applications.

Web View will also take the concept of "favorites," or bookmarks for frequently visited Web sites, and apply it to local network locations. Other features include the ability to embed hot links in documents and a "control panel" to help users locate PC-related problems.

Joel Diamond, technical director of Media, Pa.-based WUGNET, a Windows user group, said many of the new interface features will be useful. The interface will give users new ways to create, manage and archive documents by allowing them to assign uniform resource locator addresses to each document, he said.

Vendors want to meld interfaces for Web browsers and operating systems. Page 41

TELECOMMUNICATIONS REFORM

FCC to take closer look at online traffic

By Kim Girard

FOR NOW Internet service providers will keep the special privileges that allow them to avoid paying interstate access charges to local exchange carriers.

But the Federal Communications Commission does plan to scrutinize online traffic more carefully.

That's the latest word as the federal agency grapples with telecommunications reform. The FCC is considering ways to deal with the explosion of Internet use and companies jostling for a piece of the local exchange market.

GIVING NOTICE

In a notice of inquiry issued Dec. 24, the FCC requested comment on whether Internet traffic should be considered separately from long-distance access charge reform.

The FCC said it wants to create incentives "to allow more efficient transport of data traffic." But the agency didn't move to install any fees for Internet service providers.

Joel Maloff, president of Maloff Co. in Dexter, Mich., said the FCC did the right thing. "Regulators ought to keep their hands off that," he said.

"Yeah, the [Internet service providers] are getting a free ride, but they're paying for facilities, too," Maloff said. "It's not a free lunch."

But Tom Nolle, president of the CIMI Group, a Voorhees, N.J., consultancy, said there may be a need to reconsider flat rate, unlimited usage schemes, such as the $19.95 rate recently adopted by America Online, that tax some of the local exchange carriers' switches by encouraging nonstop use.

FASTER, BETTER

Robert Moskowitz, technical support specialist at Chrysler Corp. in Auburn Hills, Mich., said he hopes that if the FCC implements access charges for service providers, it creates "intense creativity to get the traffic off the telephone company's switches."

That would mean the possibility of faster and better service through new technologies such as wireless, he said.

In another move last month, the FCC also decided to review access charges that long-distance companies pay local telephone companies to use their lines.

Long-distance companies have been clamoring for months for relief from the fees — between 2 and 4 cents per minute on both ends of a completed call — claiming the cost is inflated. Overall, long-distance companies pay local exchange carriers an estimated $13 billion in annual access fees.

Under the notice of inquiry, the FCC will investigate changing the long-distance access fee rate structure.

SOME PAYMENT PLANS

National Internet service providers charging a $19.95 flat rate for unlimited access:	Online services charging a $19.95 flat rate for unlimited access:
→WorldNet	→America Online
→Prodigy Internet	→The Microsoft Network
→SpryNet	→Prodigy Classic

→CompuServe charges $24.95 for 20 hours and $1.95 for each additional hour

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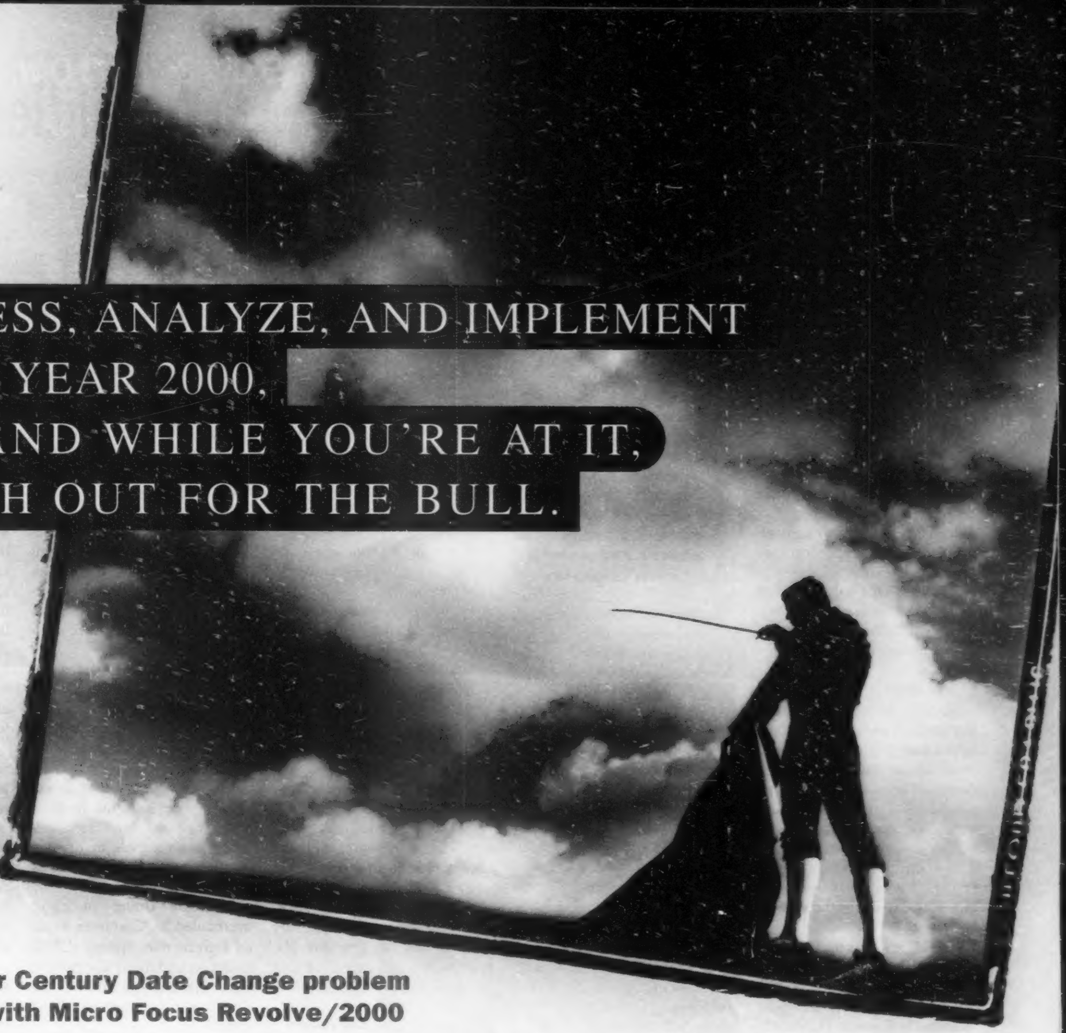

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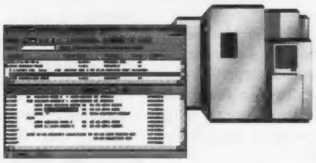

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SAP recasts R/3 for out-of-the-box use

By Randy Weston

SAP AG MAY have killed plans for a scaled-down version of its flagship R/3 product, but that doesn't mean it is giving up on smaller companies.

The German software giant two years ago scrapped plans to develop a "lite" version of R/3 for small to midsize companies because it couldn't decide which pieces of R/3 to eliminate.

Instead, SAP is re-engineering the R/3 application package to make it easier to configure and install. That will make R/3 more cost-effective, which SAP hopes will make it more attractive to midsize companies.

A sample of R/3 enhancements in 4.0

- Sold in three separate modules rather than one large package
- More detailed business processes defined within the software to cut down the need for re-engineering consultants
- Improved configuration software that will penetrate deeper into the application
- More detailed application programming interfaces to reduce customization

LOWER COST

"The high cost of SAP is not in the product, but in consulting," said Adam Thier, an analyst at Meta Group, Inc. in Stamford, Conn. "Consultants and large companies want to fuss around with R/3 configurations and with corporate business processes. But now you get people saying, 'We can just use it out of the box and skip the consultant costs.'"

According to current estimates, firms that install R/3 spend between $3 and $5 on consultants for every $1 spent on software licenses, Thier said.

But smaller companies generally don't have a lot of long-standing business processes to re-engineer when they install new software systems, so the consultant costs can be limited to simply installing and configuring the packaged application.

For example, Boston Beer Co. installed an R/3 package in four months. The process went quickly because the company decided to configure the software and install it before it made any internal changes to the way it does business, said Martin Roper, the brewery's vice president of marketing and business development.

With annual sales of $150 million, the brewery has an information systems budget of roughly $1.3 million, a fraction of what most SAP customers spend. To speed implementation, configurations were selected in one day rather than weeks, and SAP provided three consultants to help.

Boston Beer used Version 2.2E of R/3. But Version 4.0, which hits the market later this year, is expected to be a more complete out-of-the-box package solution.

With most Fortune 500 companies already migrating to client/server, SAP needs to go after companies in the $200 million to $700 million range to maintain its No. 1 spot in the industry, analysts said.

To do that, the company must overcome the idea that R/3 implementations are massive, two-year, multimillion-dollar projects, a perception that has scared smaller companies away from considering SAP.

"When I talk to clients about, say, finance software, everyone has PeopleSoft on their list and most have Oracle," Thier said. "When I ask them about SAP, they say, 'no way; we are too small to take on a project like that. SAP is too expensive and takes too long to implement.'"

Can fledgling SAP consultants still cash in on the market? Page 75

N.Y. utilities merge

▸ *Object-oriented systems will aid $4.5B deal*

By Thomas Hoffman

OBJECT-ORIENTED systems are supposed to be easy to adapt to new business conditions. Object pioneer Brooklyn Union Gas Co., which last week announced a $4.5 billion planned merger with Long Island Lighting Co. (Lilco), will soon find out how true that is.

Industry experts said deregulation is driving mergers and acquisitions in the utilities industry. But they predicted electric and gas companies will be forced to break up into "components." A spun-off component might run nothing more than power plants or manage electrical wires, said Bruce Radford, editor of *Public Utilities Fortnightly* in Vienna, Va.

"What these companies are doing is merging so that when the ultimate breakup occurs later, the broken-up parts will be big enough to operate on their own," Radford said.

For Brooklyn Union, that will mean the ability to use its ParcPlace-Digitalk, Inc. Smalltalk programming tools to develop core applications quickly for its new business entities.

Brooklyn Union in 1990 overhauled its Customer Related Information System (CRIS) under an ambitious $45 million effort that analysts said was the first major commercial object system.

The utility has been able to reuse much of the code from the revised system, called CRIS II, in subsequent systems projects.

The CRIS II success — praised in a 1992 *Harvard Business Review* case study — is one reason why Brooklyn Union "has been one of the leading companies" in adapting to the new regulatory environment, said Ronald Barone, a utilities analyst at PaineWebber, Inc. in New York.

DIVIDING DATA

To succeed in the deregulated landscape, utilities will also have to rely heavily on data warehousing systems to segment their customer bases narrowly and spot new revenue opportunities in an era of increased competition, said Steven Strassberg, a utilities analyst at Lehman Brothers, Inc. in New York.

IS executives at Brooklyn Union and Lilco were unavailable for comment.

The merger could take 12 to 18 months to gain final approval from stockholders and regulators.

Executives at the companies said they expect to slash $1 billion in overhead over the next decade by trimming the combined workforce through attrition — not layoffs — and streamlining operations.

Brooklyn Union has an IS staff of about 200. Lilco has a total of 5,000 employees but wouldn't release the number of employees in each department, a company spokewoman said.

Frame-relay net tools: Ignore them at your peril

By Patrick Dryden

USERS MAY put off a helpful migration to frame-relay network connections or pay too much for the privilege if they aren't aware of a growing arsenal of monitoring tools and services.

The packet-switching technology provides a cost-effective way to carry diverse traffic — including SNA sessions — across a wide-area network because of its speed, reduced overhead and flexible subscription levels.

Not until this past year have vendors introduced or enhanced their WAN management tools with detailed support for frame-relay networks.

Integrators have stepped up their monitoring services to assist users who can't afford to learn these tools or keep frame-relay experts on staff. And just recently, carriers have begun adopting some of these tools and services themselves to better explain frame-relay usage to subscribers.

DANGER AHEAD

Ignore such help at your peril, users and analysts warn.

"The host monitor could show that everything is fine, yet our IP network could be in a heap," said Dave Klinzman, director of network services at Long's Drug Stores of California, Inc. in Walnut Creek, Calif.

Klinzman turned for help to a specialized network monitoring service, which now collects and interprets performance statistics taken every 15 minutes from the router in each of the 335 stores throughout the chain.

Some WAN planners still balk at migrating their private SNA lines to a public frame-relay service, despite its widespread popularity, said John Morency, principal at The Registry, Inc., a network consultancy in Newton, Mass.

"Even IBM has cut over its global network to frame relay. So for most users, it's a question of when more than if," Morency said. "They hesitate due to questions about their ability to maintain transaction response times, manage the connections and secure optimal tariffs."

Another problem arises when novice implementers take the typical "ready, shoot, aim" approach to building frame-relay WANs, according to users and consultants.

Without the help of performance modeling and analysis tools or outside expertise, they first subscribe to a committed service level and later try to figure out how much capacity they really need.

COSTLY MISTAKES

Unless users can closely examine the daily utilization of their frame-relay circuits, they wind up paying the recurring cost of their mistakes by not adjusting subscription levels or balancing loads as usage fluctuates.

Users who have migrated huge networks to frame-relay links "love it after they get over some glitches but are disgruntled and annoyed by their inability to track usage," said Jennifer Pigg, data communications vice president at The Yankee Group, a consultancy in Boston.

The bottom line, she said, is that they want to prove that they get what they purchase.

Users may still wind up "shooting in the dark" with the tracking data they receive "because fine-tuning networks today is very, very difficult," said Steve Taylor, president of Distributed Networking Associates in Greensboro, N.C.

"The good news is that frame is so aggressively priced," Taylor said, so paying extra for a slightly oversubscribed network might not matter too much.

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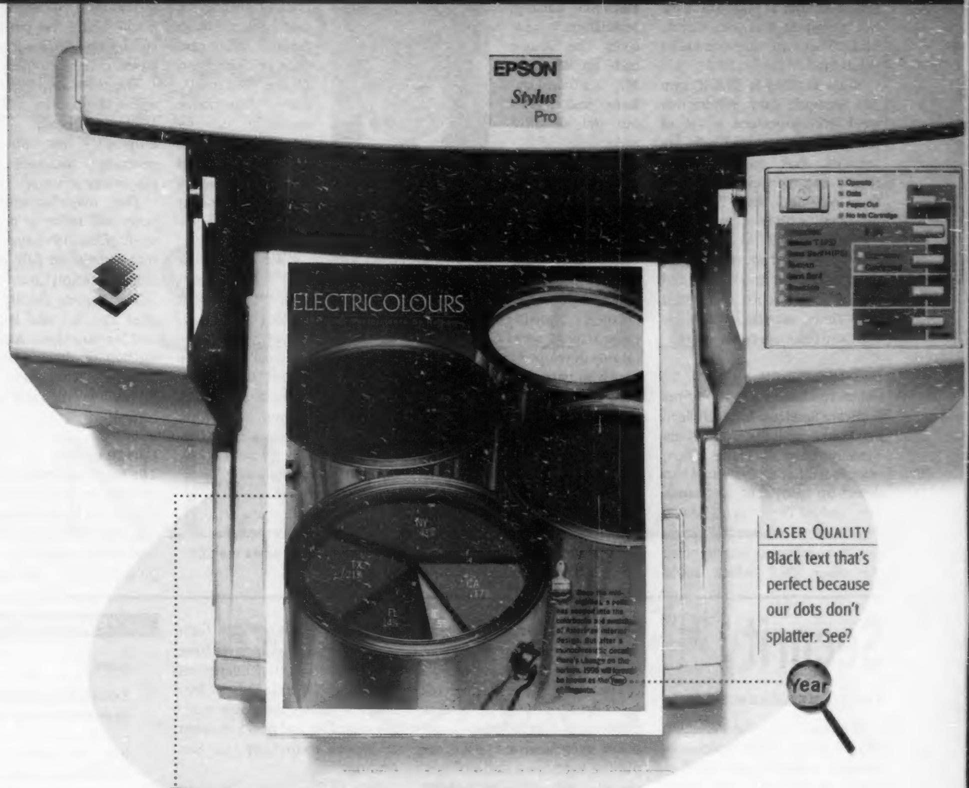

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MatriDigm

CONTINUED FROM PAGE 1

tree Group, a Dayton, Ohio-based information technology consultancy.

If you think this sounds too good to be true, you aren't alone.

"It sounds like a lot of hot air," said Abe Lichtig, a technical specialist at the information resources department of Consolidated Edison Company of New York. Stephanie Moore, a senior analyst at Giga Information Group in Westport, Conn., said, "There are no silver-bullet solutions."

Not according to MatriDigm. The Fremont, Calif., vendor this week will introduce a set of rules-based automated software services that the company claims can convert millions of lines of Cobol, in a minimal time span, with 100% accuracy.

"Think of us like Photomat — drop off your source code, go shopping, we'll modify it, and then you can reinstall it," said Ken Titow, MatriDigm's president and chief operating officer.

ONE-TWO PUNCH

Other vendors, such as Peritus Software Services, Inc. in Billerica, Mass., and Electronic Data Systems Corp. in Plano, Texas, offer tools that analysts said can detect up to 95% of date-sensitive code. Titow said MatriDigm's use of context and usage-sensitive software lets it "find the other 5%," which could make a world of difference to information systems shops.

A spokesman for Peritus said the company has achieved 100% success in extracting date-sensitive code in all 25 of its pilots thus far.

MatriDigm's automated services involve no human interaction. Customers can either send MatriDigm their Cobol source code electronically or download it to a tape. Using rules-based software developed by its chief technology officer, Frederick Chiang, MatriDigm analyzes the source code on Windows NT 4.2 workstations and ferrets out date-sensitive code.

Greentree Group's Bill Wachel: MatriDigm's services would be attractive "if they can truly do turnkey operations"

Even 30-year-old "spaghetti" code that has been patched dozens of times can be converted using the rules-based system, Titow claimed. MatriDigm recently came across a set of Cobol applications developed by a programmer who named each month of the year after former girlfriends. MatriDigm's systems applied logic to those abstractions to determine that "Mary" (January) was greater than "Jane" (February), Titow said.

MatriDigm has been working with the state of Nevada since last summer to convert 1 million lines of payroll and purchasing code. Although the beta test hasn't yet delivered "conclusive" results, Marlene Lockard, director of the state's department of information services, said the converted code matches the 3-year-old, highly modified code it sent.

Titow also claimed customers can send MatriDigm blocks of modules that the vendor can convert and then reintegrate with nonconverted modules.

MatriDigm's claims have brought a healthy dose of skepticism from year 2000 project managers such as Lichtig and Moore. "My immediate response would be, 'Let me take a look at your warranty,'" said Lauris Nance, a year 2000 project manager at Equifax, Inc. in Atlanta.

"We don't think they'll be a problem," Titow said. "If they want their money back, we'll give it to them."

Nance and consultant Jackie Bachenberg said they have talked with 75 to 100 vendors that have offered "anything from a silver BB to a silver bullet," Nance said. So far, nobody has come back with a "perfect" approach, she said.

To get support for year 2000 work, scare the CEO. Page 49

Iomega to lay off up to 700; manufacturing moves offshore

By Matt Hamblen

WHAT COULD MEAN cost savings for Iomega Zip drive customers won't be such good news for hundreds of Utah-based Iomega workers.

Iomega Corp. plans to eliminate 500 to 700 workers at its production, manufacturing and distribution facilities in Roy, Utah, where the personal data storage products company is based, company officials said.

DATA STORAGE

The reductions will begin in March. Affected employees are being offered severance packages and outplacement services.

The manufacturing operations will move to a 360,000-sq.-ft. plant in Penang, Malaysia, that Iomega in July purchased from Quantum Corp.

The Penang facility will produce Zip, Jaz and Ditto drives and Jaz cartridges. And the production of those cartridges by Iomega's contractor, Seagate Technology, Inc., will be discontinued.

LOWER COSTS

The move to Penang is expected to drive product costs down for customers because manufacturing will be closer to storage component suppliers and shipping costs will drop, said Wayne Stewart, chief operating officer at Iomega.

But one analyst questioned whether customers would actually see lower prices. The cost of Iomega's Zip drive dropped last year from $199 to $149 because of market pressure, but further reductions are unlikely, said Craig Symons, vice president of Giga Information Group in Westport, Conn.

"In terms of pricing, Iomega's in a very aggressive market, and I don't think you'll see any savings passed on to customers" because of the move to Penang, Symons said.

FINANCIAL ADVANTAGE

Manufacturing in Penang may give Iomega lower labor costs and other financial advantages that will keep the company strong and help the desktop drive user in the long run, he said.

An Iomega spokesman said a company rebate on Zip drives announced in March effectively lowered the drive's price to $149. At that time, Iomega said it planned to reduce the price to $99 within two years.

Roy, a bedroom community of 30,000, will remain Iomega's headquarters. Of its 2,900 workers worldwide, Iomega employs about 1,900 in Roy.

Security

CONTINUED FROM PAGE 1

The report said the Pentagon should invest $580 million in security research and development in the next five years. Existing products don't meet requirements for large-scale distributed computing environments and generally don't protect against denial-of-service attacks, it said.

Members of the Defense Science Board refused to discuss the report, which is due for release later this month. One member said the report's 13 recommendations are likely to be implemented.

Last July, the White House established the President's Commission on Critical Infrastructure Protection to seek ways to protect the systems on which eight critical areas depend: telecommunications, electric power, oil and gas, banking and finance, transportation, water supplies, emergency services and government operations.

The notion of a friendly attack team draws heavily on disease prevention principles, one board member said. "We are putting together a cadre of people who will inoculate systems by attacking them," an administration official said. "This [also] has relevance … for all of private industry."

The analogy to immunization suggests that when attacked, organizations and systems will react by developing defenses — in essence digital antibodies — against future attacks.

Unlike the so-called red teams employed in the past, the new team of experts will come under the direct control of the Secretary of Defense and won't consist of people from within the organizations being attacked. "You need people who do not play by the rules because attackers do not play by the rules," the source said.

"We are at higher risk than most countries because we have become more dependent on technology," said Toney Jennings, a former Air Force security specialist and now president of WheelGroup Corp. in San Antonio.

He said the idea of a red team is good as long as it reviews systems on a recurring basis. Jennings also warned against falsely concluding that a system is 100% secure just because an attack team finds no faults.

But William H. Murray, an information security consultant at Deloitte & Touche, was less keen on the concept.

"It is based on the assumption that we don't know what's wrong with our systems, but we know exactly what's wrong with them," he said. "Some things we don't fix because it's inconsistent with the application; some we don't fix because we get user resistance; and some we don't fix because we are lazy."

FUNDING FOR INFO WARFARE DEFENSE

Area	Proposed funding
Establish warning center, response center and red team	$965M
Increase awareness for military, civilian agencies, commercial businesses and the public	$455M
Define threats and responses	Existing funds
Improve security with available low-cost technology	$190M
Establish strategy and architecture for responding to large-scale outages	$375M
Invest in security research and development	$580M
Beef up staff and skills in information warfare defense	$255M
Other	$150M
Total new funding	**$3B**

Source: Defense Science Board, Washington

Intel chip to spice multimedia menu on PCs, notebooks

By Mindy Blodgett and April Jacobs

THE NEW Intel Corp. Pentium MMX processor announced this week will enable multimedia applications to zip across the screen and provide sharper color graphics.

The Pentium MMX chips will boost PC and notebook performance and support corporate uses such as videoconferencing, sales presentations and computer-based training, vendors said.

But the MMX systems may appeal more to the home PC user than to corporate users, at least in the beginning, industry observers said.

"You will see big benefits on performance for graphics and other multimedia applications," said Mike McGuire, an analyst at Dataquest in San Jose, Calif. "But we still aren't seeing a lot of multimedia applications in corporations, and we are unlikely to."

NEC'S VERSA NOTEBOOK FEATURES:

Processor: 150- and 166-MHz Pentium MMX chips

Screen: 13.3-in.

Price: About $5,500

The Pentium MMX chip has 57 instructions added to the standard Pentium instruction set and supports applications such as videoconferencing. It will offer speeds of 166 and 200 MHz for desktops and 150 and 166 MHz for laptops.

The MMX chips are expected to boost performance for both MMX- and non-MMX-enabled applications, said Frank Spindler, Pentium processor marketing manager at Santa Clara, Calif.-based Intel. That is because of enhancements to the chip's instruction set, including an on-board cache size increase from 16K to 32K bytes.

TOUGH SELL

But users said they may not be willing to pay extra for MMX machines.

Doug Moran, information systems analyst at CRSS Constructors, Inc. in Denver, said end users may be drawn to the graphics capabilities of the MMX, but the chip doesn't fill a need at his company.

"Unless they get into videoconferencing, which could happen at some point, we just don't desperately need this," Moran said. "And on notebooks, I would worry about the battery-life issues."

Several vendors are announcing or will soon ship MMX-enabled desktops or laptops, including Digital Equipment Corp., Fujitsu PC Corp., Compaq Computer Corp., IBM PC Co., Toshiba America Information Systems, Inc., NEC Computer Systems, Texas Instruments, Inc., Dell Computer Corp., Gateway 2000 and Micron Electronics, Inc.

Specific vendor plans for the MMX include the following:

- Digital this week will announce MMX support for the HiNote VP 500 line of notebook computers (including selected models of the VP 500 line), as well as Celebris FX 200-MHz desktop computers. The chip will also be added to other notebook and desktop lines in March, Digital officials said. Pricing hasn't been determined.
- TI this week will introduce two notebooks that feature a 166-MHz Pentium MMX chip and an integrated 33.6K bit/sec. modem.

  The models will sell for between $4,999 and $5,199 and will ship in February, TI officials said.
- NEC this month plans to announce a new minitower PC and three Versa series notebooks that use the MMX. The Versa notebooks will have 166-MHz processors and will cost around $5,500. Availability hasn't been determined.

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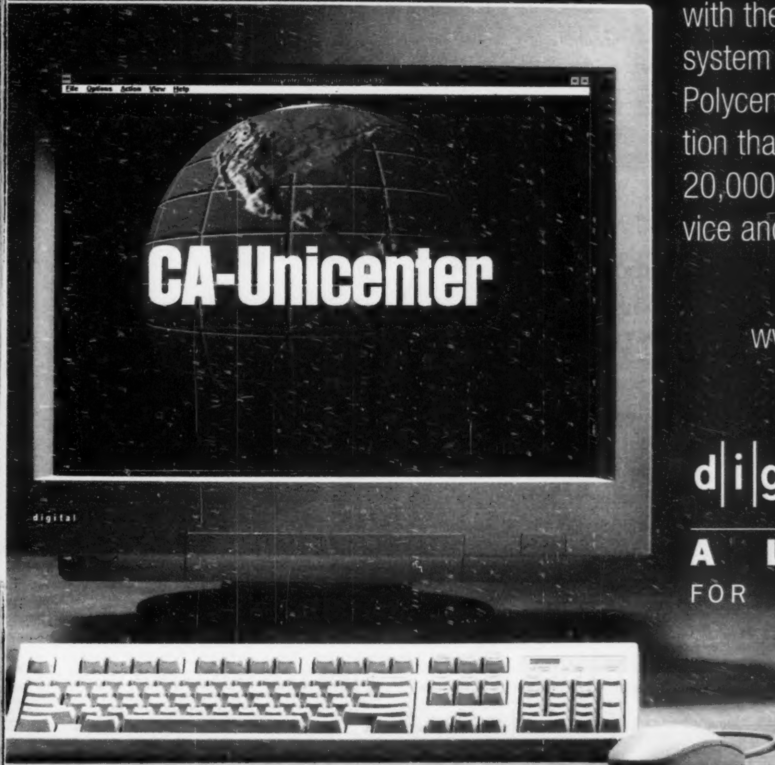

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Surge in E-mail spurs backbone support

By Barb Cole

THE STRAIN of doing business on the Internet is forcing information systems departments to beef up sagging electronic-mail backbones.

The problem, according to users and analysts, is that today's E-mail backbones can't handle the volume of traffic triggered by Internet commerce, aren't secure and often lack an adequate directory.

"My guess is that we double our messaging bandwidth every six months and will continue to do so," said Warren Smith, director of IS at Dana Corp., a maker of engine parts in Lisle, Ill.

There is a move at Dana toward using the Internet for collaboration with the car companies it serves.

"Most mail backbones really aren't ready for [Internet commerce]," said Dan Blum, a principal at Rapport Communication in Atlanta.

A mail backbone acts like a traffic cop, linking mail packages, handling message translation and synchronizing directories. It typically includes software that routes E-mail as well as gateways and a directory of users.

As companies embrace Internet commerce, they are finding that those functions are not enough. To make their E-mail backbones more robust and reliable, they need to add disk space and routers to handle spikes in E-mail traffic, messaging firewalls and enterprisewide directories, according to Blum.

For example, although E-mail is already heavily in use within companies, at least 30% of all corporate E-mail traffic will be sent via the Internet to customers and outside parties within two years, predicts Forrester Research, Inc. in Cambridge, Mass.

GET A BACKBONE

Components for building a better backbone

- Scalability
- Standards-based
- Strong messaging firewall
- Single point of connection to the outside
- Support for audit and logging of messages
- Adequate disk space and routers to handle spikes in mail traffic

This flood of E-mail will include correspondence to buyers regarding orders and individualized E-mail messages notifying customers of a sale or acknowledging a purchase. Online transactions alone could generate two to five mail messages each, according to Eric Brown, a senior analyst at Forrester.

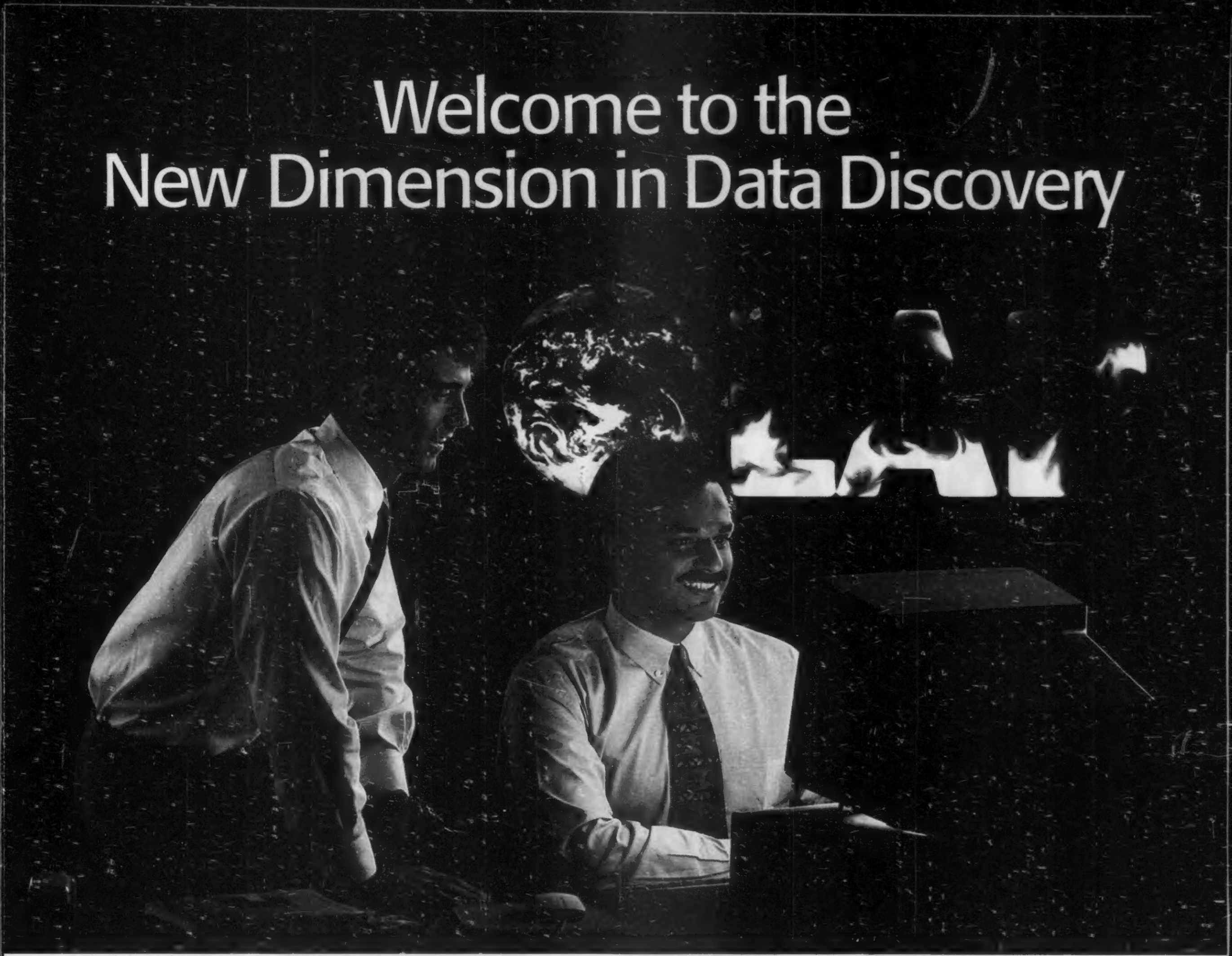
"When someone places an order, there's a message; when they check the status of the order, there's a message; and it goes on," said Eric Vaughn, director of electronic commerce at Bell Atlantic Corp. in Silver Spring, Md.

SECURITY SOLUTION SOUGHT

Security is also a concern.

For many companies, the first step in preparing for Internet commerce is building a messaging backbone based on the Internet's Simple Mail Transfer Protocol. Another tactic is to deploy servers that work with multiple mail clients, including World Wide Web browsers, Vaughn said.

Several users said they are banking on a crop of more robust directories to help solve the security issues surrounding Internet commerce. Just as a directory can track a user's name and telephone number, it can also manage user access privileges.


Welcome to the
New Dimension in Data Discovery

Software pirates' booty topped $13B, study finds

▸ *46% of all software used in 1995 was obtained illegally*

By Gary H. Anthes

GLOBAL LOSSES caused by software piracy totaled $13.2 billion in 1995, an amount that exceeded the combined revenues of the 10 largest PC software companies. In the Philippines, El Salvador, China, Russia and 18 other countries, more than 90% of the software in use has been copied illegally.

Those are among the key findings of a study conducted by the independent International Planning & Research and released recently by the Software Publishers Association (SPA) and the Business Software Alliance in Washington.

The $13.2 billion loss was up 9% from $12.2 billion in 1994. But the percentage of all software obtained illegally dropped slightly — from 49% to 46% — according to the industry groups.

Software developers and distributors take a direct hit from software piracy, but users are also hurt because they pay higher prices to offset the losses, officials at the software companies said. In addition, they are deprived of the fruits of research and development that might be funded by these lost revenues.

"Software piracy ... hinders growth and innovation," said Robert Holleyman, president of the Business Software Alliance. "The industry as a whole and, more importantly, its customers bear the burden of these losses."

Greg Wrenn, corporate counsel at Adobe Systems, Inc. in Mountain View, Calif., said the company would lower prices and invest more in R&D if piracy could be curbed, but he declined to say by how much.

Wrenn said larger companies can survive piracy, but many small firms can't afford to forgo 30% to 50% of their revenue. "A lot of these companies are on the margin, and the loss to consumers is the innovation they bring," he said.

1995 WORLDWIDE SOFTWARE PIRACY

Region	Revenue lost*
Western Europe	$3.6B
Eastern Europe	$674M
North America	$3.3B
Latin America	$1.1B
Asia/Pacific	$4B
Middle East/Africa	$521M
Total	**$13.19B**

*Estimated retail value

Source: International Planning & Research, King of Prussia, Pa.

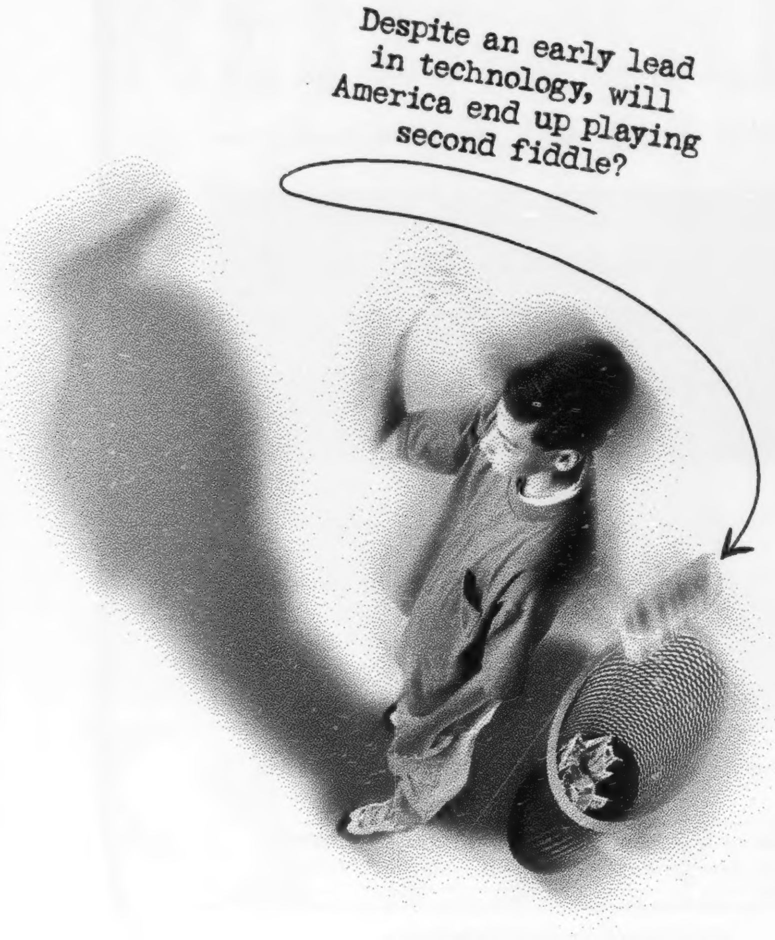
Software piracy rates ranged from 26% in the U.S. to 99% in Vietnam, the study said. It is relatively low in the U.S. partly because of a culture that respects intellectual property, said Ken Wasch, president of the SPA.

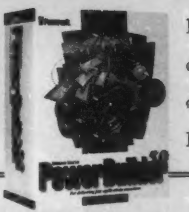
"And we have an effective enforcement mechanism here," Wasch added. "The only pirates who are safe are those who have no disgruntled employees." He said 95% of the 30 calls the SPA gets each day to report software piracy come from current or former employees of the companies being reported.

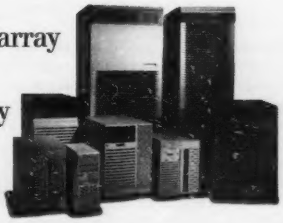
In December, an international treaty aimed at curbing piracy of digital materials was signed at a meeting of the 160-country World Intellectual Property Organization [CW, Dec. 9, 1996].

Software publishers supported Clinton administration proposals to beef up copyright laws worldwide. But online service providers, telephone companies and others said the proposals went too far and exposed them to liability they can't control.

At the 11th hour, the administration deleted language that would have made network managers liable for copyright infringement on their networks.


Despite an early lead in technology, will America end up playing second fiddle?





ONLINE LEGAL ISSUES

Copyright trips up IS

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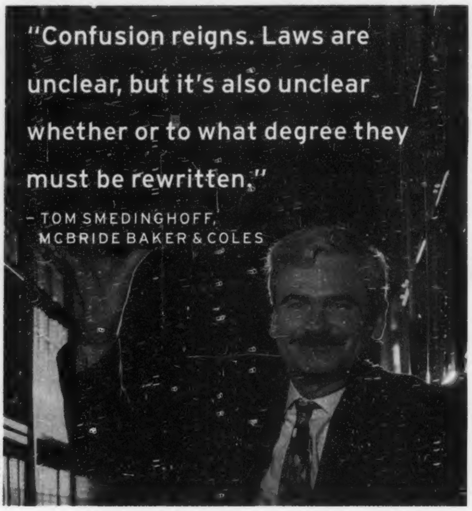


"Confusion reigns. Laws are unclear, but it's also unclear whether or to what degree they must be rewritten."
– TOM SMEDINGHOFF, MCBRIDE BAKER & COLES

MARC BERLOW

regulations is a serious question, and everyone seems to have an answer. The Clinton administration has one, as do a host of other interested parties such as Internet providers and user groups. The catch? None of the answers matches.

"Confusion reigns," said Tom Smedinghoff, a lawyer at McBride Baker & Coles in Chicago. "Laws are unclear, but it's also unclear whether or to what degree they must be rewritten."

The worry is that unless authors know their work is safe from online poaching, they won't upload valuable content. That could deter users — who may lose interest in surfing if they aren't finding much of interest — and further squelch the Internet's potential as an affordable outlet for high-quality information.

"We don't want [the Internet] to turn into television, where there's a lot of junk, and people don't get a lot of value out of it," said Diane Silver, vice president of IS at American President Lines in Oakland, Calif.

Some parties, including the Clinton administration, want to rewrite copyright laws to give content creators stronger protection. But others said the government wants to go too far, and products due this year could obviate the need for drastic legal measures (see story below).

U.S. SCARES PEOPLE

Delegates from 128 countries in the United Nations' World Intellectual Property Organization (WIPO) met last month in Geneva to revamp copyright rules. The last revision was made 26 years ago to accommodate photocopier technology.

The U.S. arrived armed with ideas for regulations that worried Seth Greenstein, a Washington lawyer.

One U.S. proposal would have outlawed devices that circumvent copyright owners' protections, such as decryption software. Some legal scholars noted that a strict interpretation of such a law could make contraband out of tape recorders and VCRs.

"There is strong opposition to a lot of what the U.S. is saying," Greenstein said. "One hopes that the legislation remains dead as a doornail."

In the end, the device proposal wasn't addressed by the conference attendees.

But the final WIPO Copyright Treaty did rule on an item of particular interest to IS managers: Copies of material made during uploading or downloading, such as in RAM, cache or routers, isn't a true copy for copyright purposes. But otherwise storing a work in electronic form is.

ONLY A GUIDELINE

But the WIPO work is merely a guideline. Individual member countries must now ratify the treaty and then revise domestic laws to comply.

Overall, the "glacial pace of lawmakers" is inadequate in the fast-moving Internet market, said Marc Pearl, a lawyer for the Information Technology Association of America (ITAA), a hardware and software trade group in Arlington, Va.

American President Lines' Diane Silver: "We don't want [the Internet] to turn into television"

The ITAA recommends a three-pronged approach to fixing online copyright problems: tweaked laws, education and more technology.

A crop of new products for making digital watermarks and managing licenses can close some of the gaps in copyright law, Pearl said.

But what can IS professionals do to protect their companies and users from copyright suits? A heck of a lot more than they have been, the experts say.

Many Internet usage policies don't include a whiff of copyright talk, focusing instead on electronic mail and Web surfing etiquette [CW, July 1].

Even programs to teach users about copyright law don't address people who use the Internet at work.

"I suppose it's an overlooked group," said Sara Ferguson, a project manager at the trade group Interactive Services Association in Silver Spring, Md. The group's Project Open campaign was designed to show home PC users how to handle copyrighted items.

IS should revise internal policies to stipulate that users must treat all material on the Internet as though it is copyrighted, Ferguson advised. "Just because you may not see a little 'c' in a circle doesn't mean the work doesn't belong to someone," she said.

Company guidelines should also include a rule that no software can be downloaded without permission from IS, added Jonathan Rosenoer, a lawyer in Kentfield, Calif. He runs a Web site about online legal issues (www.cyberlaw.com).

ASK COUNSEL

More important, IS shouldn't feel responsible for sticky legal questions, Rosenoer said. "If there's a problem, pick up the phone and call in-house counsel," he said.

One of the biggest unsolved problems is whether Internet service providers are responsible for what their customers do online.

In November 1995, a U.S. District Court in California, ruled that an Internet provider could be partially liable for copyright infringement by its customers. The vendor supplies the phone lines, servers and other gear that make it possible to access the Internet, the court reasoned. [CW, Dec. 4, 1995].

The case involved San Jose, Calif.-based Netcom, which was sued by the Church of Scientology when a Netcom user repeatedly posted protected church works to a Usenet newsgroup.

Some Internet companies and lawmakers consider the Netcom decision a guideline.

Hot

A sampling of copyright-related Web sites

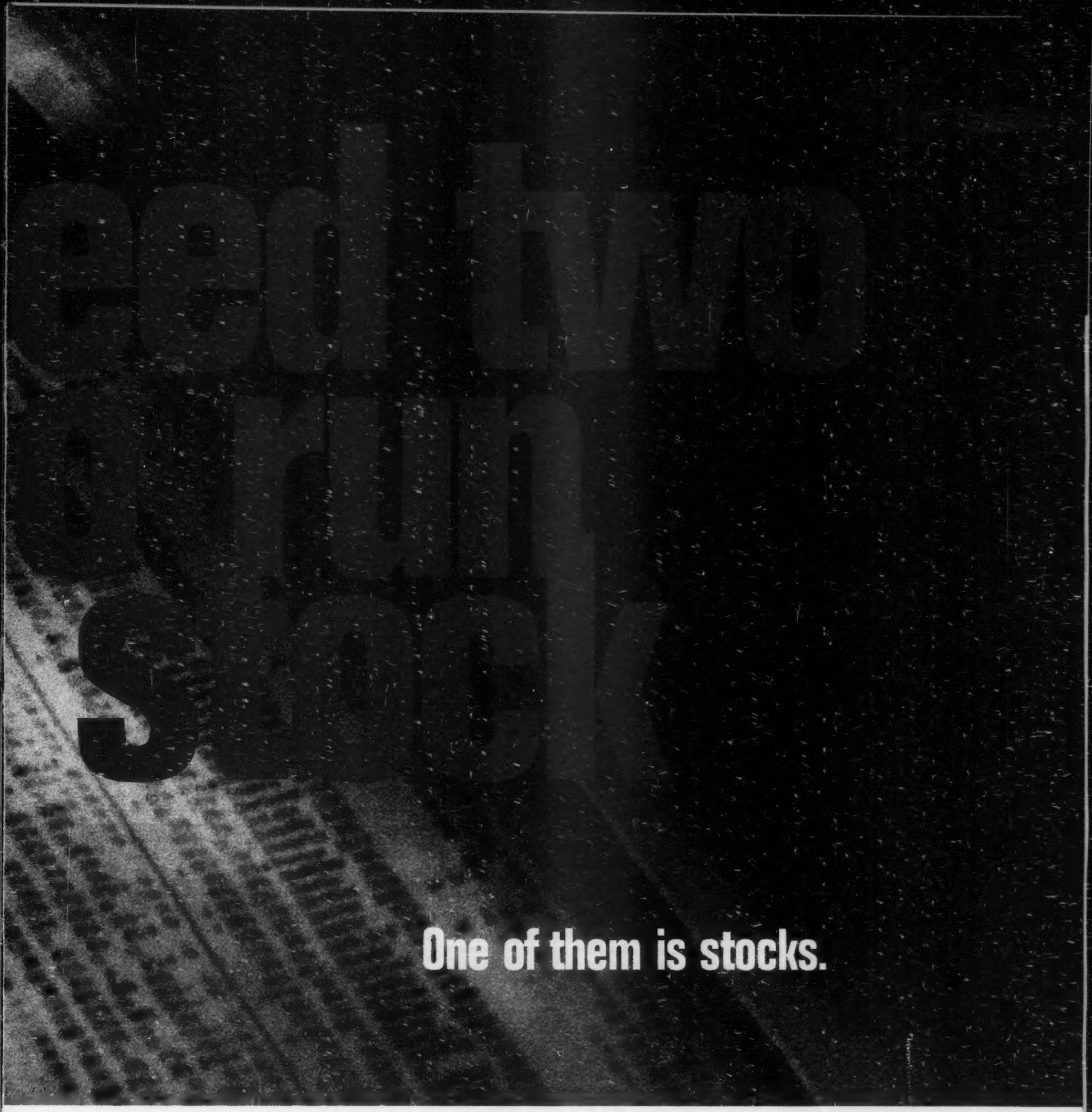
- **The nonprofit Electronic Frontier Foundation offers a rundown of issues that surround intellectual property at www.eff.org/pub/Intellectual_property/. It outlines the history of copyright debate and provides lots of links to related Web sites.**
- The WWW Multimedia Law Site is a gold mine of information for the copyright curious. Check out www.batnet.com/oikoumene/ for links to pertinent law publications, federal resources, legal search engines and other sites.
- **Copyright Clearance Center, Inc. at www.copyright.com/ helps users avoid breaking the law with advice on what's right and wrong in making and distributing paper copies of copyrighted material.**

Electronic safeguards on the way

When the Clinton administration released its first study of online copyright issues in September 1995, few products existed that could identify or track copyrighted bits and bytes. Since then, however, several vendors have smelled opportunity and are working on products to help the copyright cause. They include the following:

- **►*Digital watermarks*, which are akin to watermarks in pricey stationery, are embedded in images or text to identify the file's author. Digimarc Corp. in Portland, Ore., plans to ship PictureMarc early this year. The product inserts 76 bits of copyright and other identifying data into images created with Adobe Systems, Inc.'s Photoshop 4.0.**
- **►*Embedded templates* are similar to digital watermarks but can be seen only by rightful owners or licensees of copyrighted material. Xerox Corp.'s Palo Alto Research Center in Palo Alto, Calif., came up with the Digital Property Rights Language to create such templates. And NetRights, L.L.C. in Lebanon, N.H., last month shipped an alpha-test version of Attribute, a product that embeds into a work hot links that viewers can click on to see information about the author and how to license the work. Beta tests are expected this month.**
- **►*Encrypted envelopes* are wrappers put around copyrighted files that can't be unlocked without an authorized digital key. One example is IBM's Crytolope product, which requires a Netscape Communications Corp. Navigator or Microsoft Corp. Internet Explorer browser to be read. InterTrust Technologies Corp. in Sunnyvale, Calif., this quarter is to ship a similar product, called DigiBox. — Kim S. Nash**

The other is information. Because no trade would ever be made without it. And helping clients manage information—not just process it—is what Unisys does best. That's why Unisys solutions are trusted for the most demanding jobs—like trading over 800 million shares in a single day. Unisys systems support 500 transactions a second, transmitting details to over 3,000 workstations. And Unisys is behind everything from managing a quotation database to maintaining the world's first "electronic trading floor." It's all part of information management—our way of helping you


eed two
run
stock
One of them is stocks.

Briefs

SoftQuad buys Alpha

SoftQuad International, Inc. in Toronto, Canada, said last week it will acquire Alpha Software Corp. in Burlington, Mass., a developer of database software for business users, for approximately $7 million in cash and stock. SoftQuad, a provider of content publishing products for the Internet and corporate intranets, will blend Alpha Software's products into its PowerWorker product line.

Ascend acquisition

Looking to diversify beyond remote access, Ascend Communications, Inc. last week bought StonyBrook Services, Inc. in Bohemia, N.Y., for roughly $29 million. StonyBrook's products support real-time network management and archive historical data. The StonyBrook products will be enhanced to support Alameda, Calif.-based Ascend's entire product line.

CA loses appeal

Computer Associates International, Inc. lost a bid last week to appeal a court ruling that requires it to return the DataVantage mainframe application development software to the original developers and pay more than $12-million. A New York Supreme Court judge ruled against Islandia, N.Y.-based CA, and then an appeals court upheld the ruling. CA tried to appeal the case to the state's highest appeals court but was rebuffed.

AT&T spins off NCR

AT&T Corp. in Basking Ridge, N.J., last week completed its spin-off of NCR Corp. with the distribution of more than 100 million shares of NCR common stock to AT&T stockholders. In Sept. 1995, AT&T announced it would separate into three publicly traded companies. The company spun off its majority interest in Lucent Technologies, Inc. in September and sold its majority position in AT&T Capital Corp. to investors in October. AT&T stockholders received 0.0625 shares of NCR stock for each outstanding share of AT&T stock.

Client/server shock deflates CA stock

By Patrick Dryden

THE NEW YEAR is starting off rough for Computer Associates International, Inc.

The world's second-largest software company saw its stock price drop 21% on Dec. 27 after it warned analysts that sales for its third quarter wouldn't meet projections.

CA officials said revenue would come in between $1 billion and $1.1 billion; analysts estimated revenue to be $1.1 billion to $1.2 billion.

CA blamed the $100 million shortfall on slow client/server software sales in Europe. The company now derives 40% of its revenue from client/server products, as it shifts its emphasis from mainframe software.

The trouble comes just as CA is preparing to launch this month a significantly overhauled version of its enterprise systems management software.

CA is betting the future on CA-Unicenter: The Next Generation (TNG), a platform that offers a three-dimensional view into business processes spanning clients, servers and host systems.

"I hope the rollout of Unicenter TNG gets things back on track," said Chris Mortenson, an investment analyst at Alex. Brown & Sons, Inc. in New York. He said the third-quarter shortfall is "something they can correct."

The slip in revenue should be viewed as "a pothole on the road to supporting distributed computing environments," said Charles Phillips, managing director at Morgan Stanley & Co. in New York.

CA has pushed Unicenter software more smoothly here than in Europe, according to Phillips, because the European sales force has lacked equivalent understanding of client/server technology and resources, such as benchmark centers and reference sites.

CA needs to clarify what benefits Unicenter can deliver to users, said Paul Mason, an analyst at International Data Corp. in Framingham, Mass.

"Unicenter: TNG demos well and contains a rich set of functions, but CA just hasn't done a good job of explaining what it can do," he said.

Corrections are under way, according to analysts and CA officials.

Problems in Europe should be fixed before the end of June, according to Sanjay Kumar, chief operating officer and president of CA in Islandia, N.Y.

By contrast, European sales this quarter have been fine for archrival Tivoli Systems, Inc., officials at the management software arm of IBM in Austin, Texas, said.

NO CAUSE FOR CONCERN

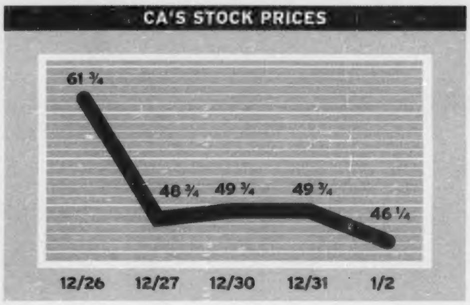
CA remains "extremely strong financially," so customers shouldn't be concerned, Mortenson said.

CA is cutting expenses to hit earnings projected for the quarter, Phillips said, but he doesn't "see any impact on research and development."

The heat will be on the sales force to get more aggressive, Phillips said, "so that's the reason your CA sales rep will be in your face more this year."

CA will report financial results on Jan. 21.

CA'S STOCK PRICES



• User pitch: One-stop shopping

WorldCom, MFS tie knot

By Kim Girard

LDDS WORLDCOM, INC. and MFS Communications Co. have hammered out final details of a $13.56 billion telecommunications merger that will mean expanded one-stop shopping for corporate customers.

Shareholders from the two companies approved the MFS WorldCom union Dec. 23 and settled the deal last Tuesday. The agreement converts each share of MFS stock into 2.1 shares of WorldCom stock.

With the merger under its belt, MFS WorldCom will be poised to trot out local, long-distance and international telephone service, Internet access and data services on one international fiber network.

"I would expect you'd see a quick rollout of services to their customer base," said Bob McNamara, managing director at Broadview Associates, a mergers and acquisitions advisory firm in Fort Lee, N.J.

MFS Worldcom's image as "a scrappy, very competitive, low-cost service-oriented organization," appeals to Fortune 500 companies seeking alternatives to the big three carriers — MCI Communications Corp., AT&T Corp. and Sprint Corp., McNamara said.

MORE INVESTMENT

To succeed in the telecommunications wars, MFS WorldCom needs more investment capital, better penetration in major cities and may need to stake a big claim within the wireless market, McNamara said.

MFS owns fiber-optic networks in 45 North American cities and boasts trans-Atlantic cable with capacity that rivals the bigger carriers.

But unlike AT&T, MCI and Sprint, MFS WorldCom lacks a strategic international partner.

MFS WORLDCOM

What WorldCom and MFS are bringing to the table

LDDS WorldCom, Inc., Jackson, Miss.

- **Is the fourth largest U.S. long-haul carrier**
- **Owns:**
  - **WilTel and its nationwide fiber network**
  - **Choice Cellular, a wireless reseller**
  - **BLT Technologies, a prepaid calling-card vendor**

MFS Communications Co., Omaha

- **Owns UUnet, a leading Internet service provider**
- **Offers local and long-distance voice and data services**
- **Has interconnection agreements with three Baby Bells**
- **Is gearing up to enter the switched local dial-tone market**

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- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/Transportation
- 70. Mining/Construction/Petroleum/Refining/Agriculture
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Dist./Retailer
- 95. Other______ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT
- 19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
- 21. Dir./Mgr. MIS Services, Information Center
- 22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech. Planning, Administrative Services
- 23. Dir./Mgr. Sys. Development, System Architecture
- 31. Programming Management, Software Developers
- 41. Engineering, Scientific, R&D, Tech. Management
- 60. Sys. Integrators/VARs/Consulting Management

CORPORATE MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
- 12. Vice President, Asst. Vice President
- 13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
- 51. Sales & Mktg. Management
- 70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
- 80. Information Centers/Libraries, Educators, Journalists, Students
- 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply.)

Operating Systems
- (a) Solaris
- (b) Netware
- (c) OS/2
- (d) Unix
- (e) Mac OS
- (f) Windows NT
- (g) Windows
- (h) NeXTstep

App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No
Intranet Products ☐ Yes ☐ No

4. Which of the following products do you buy, specify, recommend or approve the purchase of? (Check all that apply.)
- (a) ☐ Internet software
- (b) ☐ Internet browsers
- (c) ☐ Web authoring/development tools

5. Do you use the Internet? ☐ Yes ☐ No

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- 65. Communications Systems/Public Utilities/Transportation
- 70. Mining/Construction/Petroleum/Refining/Agriculture
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
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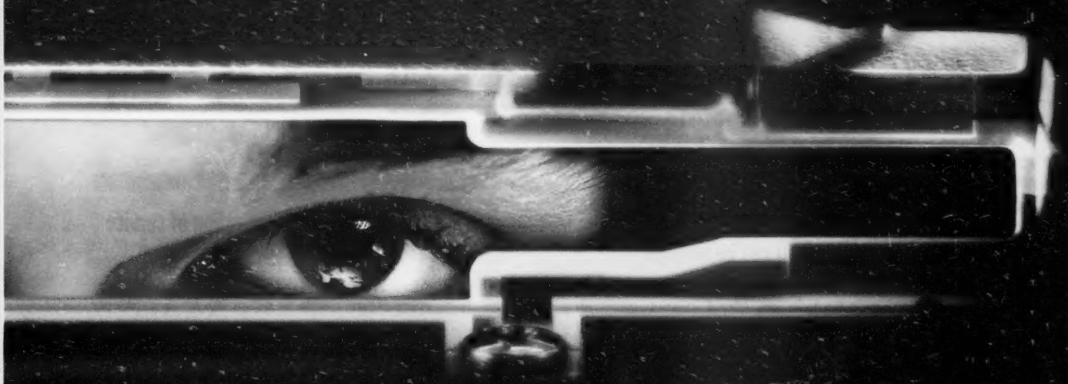

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OPINION

No hysterics Had enough of the year 2000 apocalypse yet? Well, brace yourselves; the hoopla is just now gathering steam.

This is the year that the century date-change problems — when 99 clicks over to 00 and unredeemed computer systems read it as 1900 — will leap beyond technology newspapers such as ours and into the mainstream press. Business magazines will put millennium mayhem stories on their covers on a regular basis as they realize this is an enormous global business problem and not merely a technology one.

Time and *Newsweek* will suddenly discover it and produce virtually identical covers screaming out the worst-case scenarios. Indeed, the entire IS profession could end up surrounded by year 2000 histrionics.

Just when the public was feeling all warm and fuzzy about computers as the surfboard to the Web, it'll be slapped in the face with horror stories about hopelessly fouled-up records and collapsing businesses. Already, religious fundamentalists are reminding people that powerful computers are considered the modern embodiment of "the beast of the apocalypse."

As our software columnist, Frank Hayes, points out this week (see page 49), the time is ripe to put a good scare into the CEO and get cracking on your year 2000 plans. Straight talk is the order of the day.

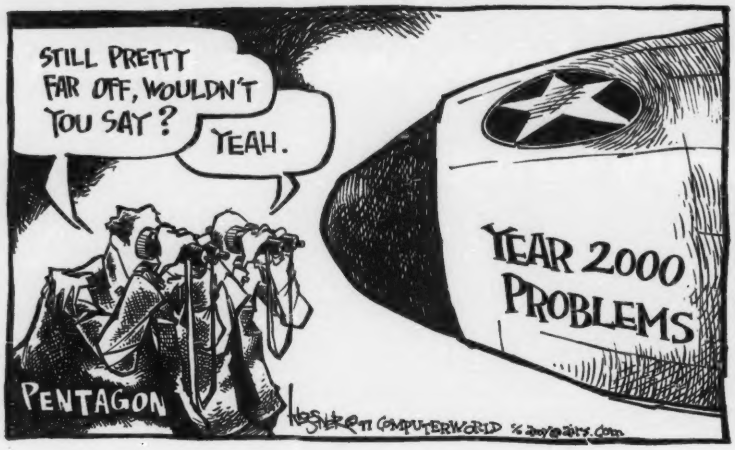
"Puncture the myths: There's no chip that will solve the problem, no magic bullet for a quick fix," Hayes writes. "There's no way out except an expensive, zero-benefit bug fix."

The one thing *Computerworld* promises to do for you in the coming year is skip the apocalyptic hysterics. We know you don't need more warnings — you need more helpful suggestions, more resources, more ideas and more useful examples. Look for lots of practical, from-the-trenches stories about how your colleagues are coping — both in our weekly issue and on our @Computerworld Web site.

And when that beast appears at the door, show no fear. Just enroll the sucker in a class for Cobol programmers. That'll teach him.

Maryfran Johnson

Maryfran Johnson, *Executive editor*
Internet: *maryfran_johnson@cw.com*



LETTERS

Carpal tunnel pain (if it's real) can be relieved

In regard to *Computerworld's* article on carpal tunnel syndrome (CTS) from keyboard use ["Conflicting rulings on carpal tunnel," CW, Dec. 16], I've been discussing this phenomenon with a few colleagues.

I have spent the past 18 years with keyboards on my lap for up to 18 hours per day, working days on end with no sleep, wired on caffeine, and probably in every position imaginable. I know many other people who do that. After our discussion on carpal tunnel syndrome, we concluded that the only complaints we have heard are usually from administrative-level individuals, who in most cases seem very unhappy. I do know people with CTS, but it never came from typing.

Is this a repeat of the days when everyone was complaining about back problems and then eye strain? A few lawsuits make the headlines, and then it goes away. What lawsuit is next on the books? Suing my company over the stress I incurred because the company Coke machine was empty?

What lawsuit is next on the books?

Dean Backhaus
IS manager
Denver
deanb@plinet.com

I'm responding to an article titled "Conflicting rulings on carpal tunnel."

I consider CTS another expression in our society of failing to accept responsibility for our actions. I work out daily, lifting weights, and I've learned to not ignore pain. When my shoulder hurts, I alter either my exercise or my regimen in a way to avoid injury.

Similarly, any individual, when feeling pain in wrists and/or fingers, should make every effort to reduce or eliminate that pain — be it a change in the daily routine or the purchase of accessories designed to accommodate a more ergonomic design. If a company is involved, costs of such accessories should be assumed by the company.

Jim Kunysz
Lake Forest, Calif.

Thank you for your editorial ["Ouch!" Up Front, CW, Dec. 16] on repetitive stress injury (RSI). Perhaps as a magazine read by many computer professionals, you could run an article on things to do to help prevent RSI. I have a mild case of RSI (brought on by 14 years in the computer industry) and have found a few things to help.

1. I bought a natural keyboard for use at home and work. Not only has it helped make the hands and wrists not quite as sore, but it also has helped the neck and shoulders by placing the hands in a more comfortable position.

2. Chiropractic — my doctor has been helping me, through manipulation of the wrists and other body parts. Many people think of chiropractors as just back and neck doctors, but they can help out wherever there are stress problems.

3. Make sure your keyboard is positioned correctly. Too often, people use desks not designed for the computer professional.

Verna O'Brien
Lockport, Ill.

Characterization of service after buyout was unfair

As the founder and CEO of MindSpring, I am deeply concerned about the article that appeared in your Oct. 28 issue titled "'net provider buyout undermines service."

Although some of the users transitioning to MindSpring from PSInet have had some difficulty, the vast majority — tens of thousands of users — had a smooth move to our service and are now happy MindSpring subscribers.

The comparatively few users who had trouble did not experience the level of difficulty described in your article: Not a single electronic-mail message was lost. A small percentage of users did experience a three-day delay in receiving mail. Once resolved, the problem has never recurred.

We regret that anyone had problems with the transition, but in the name of accurate journalism, we'd like to ask for more balanced coverage of the process.

Charles Brewer
MindSpring Enterprises, Inc.
Atlanta
charles@mindspring.com

More letters, page 38

Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

For once, the vendors may stop calling

Michael Cohn

Take it easy while reading this. Slip off your shoes. Because we're all moving a step slower. We're suffering from an extra pound or 20 of turkey, stuffing and strange-looking casseroles made by stranger-looking relatives. And we're slowly getting up to speed for 1997, barely thinking about new budgets, new projects and leftover 1996 headaches.

The feeding frenzy of 1997 begins with too many projects, not enough people

But it's time to shake off the holiday cobwebs. While industry watchers scratch their heads, let me stick out my neck and make the year's hottest prediction: We're walking into the biggest nightmare in IS history. I call it the "feeding frenzy" crisis of first quarter 1997.

All right, I was only kind of sure the Jets would make the Super Bowl this year. But I'm *really* sure about this. Everyone is behind. Everyone is supposed to be building intranets, jumping into Java and getting that data warehouse up and running. Everyone is supposed to be finishing (or starting) that SAP/Baan/database project. And then there's that year 2000 project; I think yours is supposed to get going this month!

Face it, folks, we're toast. We're about to blow a fuse. Hit overload. Not that we haven't been there before, but this year is different. Everyone everywhere is in this mess. No longer can we stay on MVS/XA, get another year out of that PDP-11 or hope that our dumb terminals can pass for thin-client network computers if nobody looks too closely.

The demand for all these emerging technologies hasn't only caught up to us — it's beating us to a bloody pulp. And to complicate matters, standing still is no longer an option, thanks to the year 2000 problem. Unless we want to commit millennicide, we have to start doing *something*. That means 1997 will be a bear. Everyone from Tucson to Tunis who can even spell PL/I will be coding, testing and billing at $110 per hour.

The feeding frenzy is about to commence. Not that it'll be all bad. Vendors will be invisible. No more nagging calls. But no more free lunches, either, because vendors will be swamped. They'll be up to their assessments in orders for software, services and even hardware. No kidding, hardware. Direct-access storage devices, tape, channels and mainframes — stuff we all thought was dead, but everyone will need to run those new applications and millennium-compliant releases.

So brandishing your brand-spanking-new 1997 budget (pea-size compared with your 1996 budget), you'll eagerly pick up the phone, but no one will answer. Everyone will be busy grinding out code, calling meetings, keeping programs up all day or keeping programmers up all night.

It's so bad that even the headhunters are worried. There aren't enough heads to go around. The demand is incredible. Everyone needs people. *You* need people. But your ads will go unanswered. And your people may head for the hills — only to return as contractors demanding $1,200 per day, private offices and 90 minutes for lunch.

This is IS. We've never been afraid of hard work. We'll get over this. We'll wake up one morning, look back and laugh. Sure, this is going to be tough. But if you're a sound, seasoned, survivor-of-two-decades IS manager, this will be just another year. Twelve months from now, you'll walk out of your office, stand before a sea of cubicles and proclaim victory. But by then, unfortunately, most of the cubicles will probably be empty.

Cohn should make a killing, thanks to 10 years of strong computer consulting experience (unless folks find out about the other five, which really weren't that hot).

And you thought 1996 was a mess

John Gantz

The weather forecast for IS professionals in 1997 is stormy, sloppy and inclement. Why? Because there's a mismatch between the fast rate at which technology is complicating IS decisions and the slow rate at which robust tools come out to implement those decisions.

Let's start with an easy mess, the migration to Microsoft's Windows NT operating system. This year, we expect the number of NT licenses shipped to big companies to outpace the number of Windows 95 licenses. Pentium Pro chip prices will drop precipitously — thanks to Intel's pesky competitors — bringing the hardware costs of running NT within reason for many companies.

There's no magic formula for NT migration. Some companies migrate the whole company, some do it a department or application at a time, some do it helter-skelter. Whatever the approach, the conversion to NT is a nontrivial exercise because of backward applications incompatibility, lack of plug-and-play capability, driver shortages and so on.

All right, that's one mess. How about groupware? Will yours be Lotus Notes, Microsoft Exchange or an intranet? Or, like many decentralized big companies, will you have a mix of all three and a few ringers besides?

This year, you'll probably need to make at least one multiyear bet in the messaging/groupware category. Once it's made, you'll have about 18 months to find out if you still have a career. Good luck.

Those are the unglamorous things you'll be wrestling with this year, without much short-term reward. Now, let's talk about the wild frontier of internal and external Web sites. We predict a four-fold increase in Web pages this year, which suggests that Web technology will run amok in corporate America. You'll run sites on this platform here and that platform there. You'll have a hodgepodge of products from scores of vendors for site management, statistics, page creation, communication, transaction management and such.

By the end of the year, you'll be sitting on a slew of legacy, client/server, messaging, groupware, intranet and Internet systems that are — in terms of directories, registries and databases — largely incompatible.

IS faces a year of Windows NT migration, groupware decisions and Web-enabled everything

Now, I know Microsoft and others are working on tools to integrate all this stuff, but I wouldn't expect useful versions to appear this year. We'll be doing a lot of waiting — waiting for NT 5.0, waiting for a follow-on to the next Exchange release, waiting for Internet Explorer 4.0 support in NT. And that's just the Microsoft product set.

So just like last year, this year will see an explosion of technologies and the Web-enabling of everything. It isn't going to be a year of retrenchment, consolidation and integration. That'll be 1998 or 1999 — if ever.

This has happened before. In the 1970s, we saw the profusion of shared-logic word processors, departmental minicomputers and the early LAN craze (before Ethernet became the standard and the market settled down).

The problem will be finding a balance between working on the basic plumbing — such as Windows NT 4.0 and 4.5 and Windows 97 — and chasing the Internet and intranet rainbows for the future.

My advice? Practice your interpersonal skills. You're going to need them as you navigate through the year.

Gantz is a senior vice president at International Data Corp. in Framingham, Mass. His Internet address is jgantz@idcresearch.com.

LETTERS

Checking the facts

Laura DiDio's column "IS: Where the girls aren't," in your Nov. 18 issue once again gives us that old song about women earning 63 cents for every $1 a man earns.

You would think it would get embarrassing after a while.

Assuming you just haven't taken the time to research the facts, let me tell you a place where you can get better informed: the Independent Women's Forum at www.iwf.org/.

According to a report written by economist Diana Furchtgott-Roth and historian Christine Solba and released by the Independent Women's Forum, "Holding all factors constant, such as experience and life situations, women earn 95 to 98 cents to a man's dollar, not the 72 cents to a man's dollar often cited."

Fred Stephens
Oak Ridge, Tenn.

Government record isn't all that bad

I'm writing about the letters printed in *Computerworld*'s Dec. 9 issue on the IRS modernization stories [which ran Oct. 14].

Every time I read another "look how incompetent and wasteful the government is" article or letter, I gasp in disbelief. I wonder whether the author or authors have ever worked in the private sector and know what goes on there.

The Internal Revenue Service is responsible for collecting approximately $2.5 trillion yearly to support the activities of the U.S. government. [The extra amount that the IRS is said to be unable to collect each year because the modernization effort failed,] $50 billion, represents about 2% of that revenue stream. Leaving aside the issue of methodology in coming up with the $50 billion figure, this is not such a great record. It is also not such a bad record in comparison with private industry.

I have participated in two IS projects for large multinational corporations that cost the companies 1.1% and 2.3% of yearly revenue, respectively. In addition, I don't know how many times a year I read in *Computerworld* and elsewhere or hear from colleagues in the business about failed, incompetent product development or internal IS projects that easily wasted this much and more.

When you start to examine other features of the IT environment inside government, such as the onerous hardware and software sourcing procedures, frequently unrealistic budgetary constraints and the salaries of government workers, the IRS' incompetence starts to turn into downright high achievement when compared with much of the private sector's IT efforts.

Joseph Sadove
New York
sadovej@acm.org

Balloon-twisting cartoon isn't just a joke

I really enjoyed Rich Tennant's cartoon at the bottom of page 2 in the Dec. 2 issue. My co-workers thought I was a little nuts when I told them about the balloon-twisting Web site I had found. One of them remembered and showed me the cartoon. Really amusing!

The site is www.fooledya.com. It has a lot of information about twisting balloons.

Apparently, there's quite a controversy over whether it's good to blow up the balloons by mouth or not. Thanks again for the humorous moment.

David Faught
Brown Deer, Wis.

©RICHTENNANT
Did I mention that we recently found a balloon folding site on the Web?

Those pesky decimals

On page 4 of the Dec. 9 issue of *Computerworld*, the table titled "Putting ISDN to the test" seems to suffer a problem with decimal places. The time it would take to download a 2M-byte file (or approximately 20M bits of transmitted data) at 4M bit/sec. is 5 sec., not .05 sec. Similar decimal errors appear in the other two calculations: Transmitting the file would take 13 sec. on a T1 line and approximately 357 sec. at 56K bit/sec. using ISDN.

I'd love to be able to download 2M bytes in a 20th of a second! At those speeds, network computers might become competitive.

Steven E. Long
Felton, Del.

Press has unjustified preference for NT

As with most of the trade press, you seem to have a preference for Windows NT as the panacea for IS. Given some of the revelations over the past few months, I have to wonder what, besides advertising dollars, is the attraction?

NT's multiplatform support has evaporated down to Alpha and Intel after Microsoft dropped the Mips [RISC processor] earlier in the year. IBM has announced it will no longer support NT on the PowerPC after the new upgrade. What operating system did IBM choose for high-performance computing on the PowerPC? Unix.

Compaq recently announced it would no longer bundle NT Server in its popular Smart Start CD set, which ships with every Compaq server. The reason: Support costs were too high. Kind of ironic for an operating system that your publication has touted as "easier to administer" than Unix. Did Compaq remove Unix from Smart Start? No, it did not.

I have yet to see a single testimonial from *any* IS director from any company in any trade magazine on how, by removing all of their Unix servers and going to NT, they have saved money, improved the quality of service and made users happier. Not a single one.

Microsoft announced that in two to three years, it will have NT running at 64 bits. Hardly blazing a trail, as Unix is already there. And scalability? With NT, I can go from one to four processors. Unix is already running on platforms with 32 processors and is still advancing.

If companies such as IBM and Compaq (especially Compaq) have turned their backs on NT, what do they know that Microsoft is hiding? Why isn't the trade press trying to expose that instead of copying Microsoft's marketing statements and calling them articles?

People like me will be watching NT very closely and will make decisions based on what we need to do today and what product will allow us to do that today. Right now, Unix is the clear choice.

Jim Wojno
Systems administrator
Telxon Corp.
Akron, Ohio
jwojn@telxon.com

COMMENTARY

There's no place like home

DAVID MOSCHELLA

HAS THERE EVER been a better time to be part of the U.S. information technology community? What industry has done more to drive the remarkable renewal of U.S. competitiveness, five straight years of economic growth and this unprecedented stock-market boom? The Internet has even restored our profession's sense of a higher mission, providing a clear path toward the once-foggy idea of a true information society.

However, we shouldn't forget that this exuberance mostly is an American phenomenon. With few exceptions, the major economies of Western Europe remain lethargic, while Japan is still struggling to overcome its steep recession of 1992 to 1994. In Tokyo, Munich and Paris, the economic benefits of a largely U.S.-controlled IT industry are very much open to debate.

FOLLOW THE GROWTH

Consider the following data from International Data Corp. From 1992 through 1996, U.S. customer spending on IT hardware, software and services has grown, on average, by 14% per year, compared with just 8% in Japan and 7% in Europe.

Consequently, the U.S. now accounts for 46% of the world's total IT spending, up from 37% in 1991. To the amazement of the IT forecast community, this share is higher than it has been in more than a decade.

Why has this happened? Certainly, macroeconomic forces have helped. Increases in technology spending are now closely correlated with overall economic growth — and growth has always occurred in cycles. Japan, as well as most of Europe, grew rapidly from 1988 to 1991, while the U.S. languished. During the last five years, the pattern has reversed. No doubt, business cycles will eventually shift again.

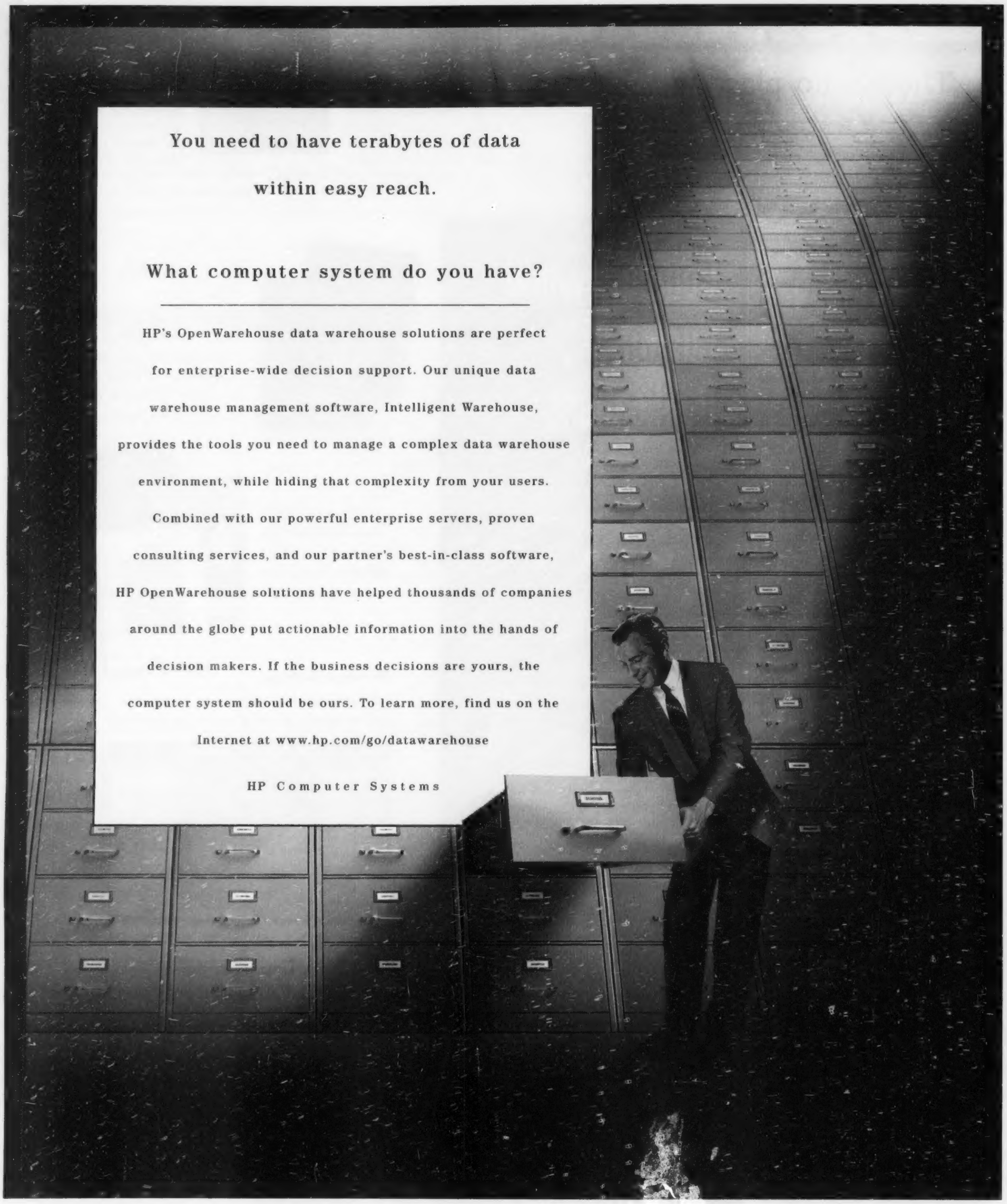
However, IT industry dynamics have also played to U.S. strengths. Our market clearly benefits from its vast size, close proximity to the IT industry's leading vendors, relatively deregulated telecommunications industry, flexible workforce, entrepreneurial culture and even the ubiquity of the English language. Indeed, the strange thing is that there are so many positive factors that you can't tell which ones are most important.

ROOM FOR MORE

As if this weren't enough, the Internet is also generating powerful critical mass effects. As networks expand, they become more useful; as more software is sold, unit costs fall. In other words, the bigger a network gets, the more compelling it becomes. Given that less than 20% of U.S. households are connected to the Internet, these "increasing returns" could last for another three to five years.

All of this leads to the following paradox. Probably the two most frequent forecasts for the 21st century are: 1) Asian economies will dominate, and 2) we will enter the Information Age. Given the huge gaps in IT usage between the U.S. and Asia, both of these statements won't simultaneously be true any time soon. Determining which forecast is right provides a worthy subject for another day. Meanwhile, if you are committed to the IT business, the U.S. is still far and away the place to be.

Moschella is senior vice president of research at Computerworld, Inc. in Framingham, Mass. His Internet address is david_moschella@cw.com.



Servers & PCs

Large Systems ♦ Workstations ♦ Portable Computing

Briefs

No more PowerPC NT

IBM and Motorola, Inc. said they will phase out their PowerPC machines that run Microsoft Corp.'s Windows NT. Apple Computer, Inc.'s Power Macintosh computers account for 90% of the PowerPC chips sold, and IBM's AIX accounts for most of the rest. Observers said despite NT's success on the Intel platform, there were virtually no applications available for NT on PowerPC.

HOW VARs DECIDE

Value-added resellers (VAR) rated the criteria they use to determine whether to carry a manufacturer's portable computers. The following rated highest on average:
4=Critical; 1=Not important

Product quality	3.6
Availability	3.46
Technical support	3.35
Competitive advantage	3.21
Customer requests	3.12
Price	3.09
Brand awareness	3.01

Base: 100 VARs

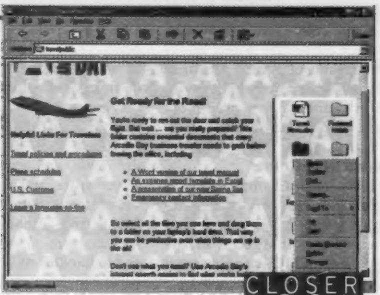
Source: Business Research Group, Newton, Mass.

Chip dumping pact

U.S. and Japanese semiconductor industry groups have extended rules that resolve chip dumping disputes through 1999. The agreement, which requires chip makers to make cost data available to trade investigators within two weeks of a dumping charge, had lapsed on July 31.

• Vendors plan new interfaces

Browsers not just for Web anymore



This prototype melds a Web interface into the next version of Windows 95 and NT 5.0

CLOSER LOOK

By April Jacobs and Sharon Gaudin

DESKTOP USERS familiar with seeing separate Internet browser and operating system interfaces may be seeing just one in the near future.

This melding of the World Wide Web browser and operating system interfaces is expected to allow users to toggle more easily between their desktop applications, such as word processing and electronic mail, and browser-related functions, such as Web surfing and intranet applications.

Dan Mezick: **Browsers are "the most important horizontal application"**

The major players in this field — Microsoft Corp., Netscape Communications Corp. and Sun Microsystems, Inc. — are plying competing strategies to bring applications and functions to users' eyes through their preferred views of the world, whether that view is from a PC or a stripped-down network computer.

The battle has evolved in just over a year. With Navigator, Netscape went virtually unchallenged until Microsoft's mid-1995 introduction of its Internet Explorer browser, which is now bundled with Windows 95.

Meanwhile, Sun's Java programming language, which lets users pick up application functions over the Internet, has created a plethora of possibilities for using desktop browsers.

This recent history has formed the strategies of all three vendors. Microsoft is emphasizing its operating systems as an entry point to applications and

Browser interfaces, page 42

300-MHz Mac clone due in July

By Lisa Picarille

UPSTART MACINTOSH clone maker Power Computing Corp. is about to show up Apple Computer, Inc.

The Round Rock, Texas, company is expected at this week's Macworld Expo to demonstrate a 300-MHz Macintosh-compatible system that will be delivered by July. Apple's fastest machine is the Power Macintosh 9500, a 200-MHz system that will soon have an optional upgrade to 250 MHz. The 9500 was released about two months ago; Apple hasn't announced plans for a 300-MHz model, according to Apple service representatives.

Also at this week's trade show in San Francisco, Power Computing is set to announce two dual-PowerPC processor cards, attractive price cuts and new bundling deals.

The two cards include a dual 225-MHz PowerPC card with 32M bytes of memory. It is ex-

Power Computing, page 42

STORAGE SYSTEMS

Switch/disk combo adds flexibility

By Matt Hamblen

A FLORIDA-BASED value-added reseller has packaged a special switch with IBM storage arrays to give users added hardware flexibility.

Champion Computer Corp. in Boca Raton, Fla., saw its sales explode last year, thanks in part to the disk array storage war between EMC Corp. in Hopkinton, Mass., and IBM's Storage Systems Division in San Jose, Calif.

Champion did it by packaging a switch with new IBM storage technology that connects to any Unix server, thereby providing more flexibility in storage and server choices, an analyst said.

Champion's monthly revenue was $100,000 last January, but it climbed to $20 million by December as users discovered that Champion was packaging the switch by Vicom Systems, Inc. in Palo Alto, Calif., with IBM's 7133 Serial Storage Architecture disk array, a Champion official said. Champion expects 1996 revenue to total $95 million and

Switch/disk combo, page 42

Digital price cuts may make Alpha a viable NT platform

By Jaikumar Vijayan

USERS CAN EXPECT to see at least one alternative to Intel Corp. platforms in the Windows NT space if Digital Equipment Corp. follows through on recent attempts to broaden the market appeal of its Alpha chips.

Digital recently rolled back prices on some of its chips by up to 50% in what analysts described as one of the company's most pragmatic efforts yet to promote the Alpha chip. With the cuts, Digital has reduced the price on some of its Alpha 21164 chips by nearly 60% over the past six months (see chart, page 42).

ALPHA CHIP

Combined with the recent introduction of its FX32 translation software, the one-two punch could be Digital's best shot yet at widening its base of Alpha users, analysts said. FX32 allows users to run x86 software without modifications on Alpha hardware.

The price cuts come at a good time, said David Krauthammer, director of information systems at Parker Hannifin Corp. in Rohnert Park, Calif.

"Alpha seems to be taking the performance edge over Intel, and its compatibility with Intel applications is pretty good, too," Krauthammer said.

"This is a good opportunity for Digital, but a lot is going to depend on the aggressiveness of their strategy" and ability to execute it, he said.

"Digital's decision to reduce prices to the extent they did means they are going gangbusters after the high-end commodity market," said Terry Shan-

Alpha, page 42

POWERPC PROCESSOR PROGRESSION

October 1992
Motorola ships 50- and 66-MHz 601

October 1995
IBM ships [illegible] 604

May 1996
Motorola and IBM ship 200-MHz 603E

July 1996
IBM ships [illegible] 604E

October 1996
Exponential unveils 500-MHz chip; Motorola and IBM announce 240-MHz 603E

1997
Motorola and IBM expected to ship G3 line, based on 603E and 604E chips running at 200 to 400 MHz

1999
Motorola and IBM expected to ship G4 line, running as fast as 500 MHz

Switch/disk combo

CONTINUED FROM PAGE 41

predicts the figure will soar to $250 million this year.

One customer tripled the data transfer rate with the test package Champion provided. "It's pretty amazing," said Robert Grim, director of sales systems development at MCI Communications Corp. in Colorado Springs.

The Vicom device, which Champion packages under the name of Commander, is a circuit card connected to the IBM disk array and any SCSI-II FW server. Grim wanted to attach the IBM disk array to a Sun SPARC-server instead of an IBM RS/6000 that MCI had been using.

Grim tested IBM's biggest competitor in the field, EMC, but found EMC's offering didn't change the data transfer rate.

Tom Lahive, a storage analyst at International Data Corp. (IDC) in Framingham, Mass., said he sees EMC's offering as more expensive than IBM's with the Vicom device. "The big story is that storage is now detached from the server sale, which allows the IS guy to buy any brand of server. And they can also buy anytime they want after market if they need more storage later," Lahive said.

BACK IN THE FRAY

Lahive said Champion's merchandising of the Vicom device with IBM's disk array has helped put IBM back in the fight with EMC for an external disk market that reached $4.6 billion worldwide last year. According to IDC figures, EMC took $688 million of that total, and IBM was second with $647 million.

Vicom President Samuel Tam said his company's switch, also known as Serial Loop Interface Controller, is packaged with disk drives by 15 companies, of which Champion is the largest seller.

Alpha

CONTINUED FROM PAGE 41

non, editor of "Shannon Knows DEC," a newsletter in Ashland, Mass. "The question becomes, to what extent are they going to do this, and how successful are they going to be?"

Until now, the Alpha chip has been targeted mainly at the Unix and enterprise NT server space and the high-end technical workstation market. For instance, it powers Digital's AlphaServers, AlphaStations and a handful of similar products from clone vendors.

Outside of this base, however, the chip has failed to make much of an impression. Despite being popularly acknowledged as a technology leader in the microprocessor industry, Digital has failed to gain much software vendor support in the PC space.

FREE-FALLING ALPHA PRICES

Chip	July 1996 price	Current price
■ 300-MHz Alpha 21164	$695	$395
■ 366-MHz Alpha 21164	$950	$495
■ 433-MHz Alpha 21164	$1,492	$750
■ 500-MHz Alpha 21164	Not available	$1,450

This failure to inspire software vendors to develop applications specifically for the Alpha platform has weighed heavily against Digital — especially because the RISC-based Alpha chips have cost more than Intel processors.

Analysts expect that some of this could begin to change with Digital's recent pricing actions and the availability of FX32 software. For instance, the company expects to announce around the middle of the year Windows NT PCs that cost less than $3,000 to compete directly with Wintel boxes.

And the Alpha's new ability to run most Intel-based applications through emulation could broaden its appeal among users who use heavy number-crunching applications but have only a limited need for office productivity applications.

"The one thing that has been demonstrated, at least historically with Alpha, is that Digital has been able to deploy significantly higher performance than Intel," said Dean McCarron, an analyst at Mercury Research, Inc. in Scottsdale, Ariz. "With the price decline and their FX32 emulation, there is no question their prospects have brightened considerably."

Power Computing

CONTINUED FROM PAGE 41

pected to cost $4,995. The other card — a dual 250-MHz model — is, at least for now, just a technology demonstration, according to Bill Goins, Power Computing's marketing director.

Power Computing is also offering some new bundling deals and show specials. The company plans to bundle Macromedia, Inc.'s popular Director and Shockwave, a $900 value. Show attendees can get $250 off any Power Computing system that costs more than $2,500. The company will also throw in a free modem.

Power Computing's 300-MHz machine is expected to offer performance on par with high-end Intel Corp. Pentium processors. Intel is slated to deliver its next-generation P6 chip, code-named Merced, by midyear.

Neither of the primary PowerPC chip makers — IBM's Microelectronics Division in Fishkill, N.Y., and Motorola, Inc.'s RISC processor division in Austin, Texas — has officially announced a 300-MHz PowerPC chip.

But IBM and Motorola last summer announced their intentions to deliver this year a line of PowerPC processors — called the G3 line — with speeds ranging from 200 MHz to 400 MHz.

Additional reporting on this story was done by @Computerworld staff writer Stewart Deck.

NEW PRODUCT

SARIF, INC. has announced the Shuttle LT800, a portable data/video projector that features the company's proprietary polysilicon technology.

According to the Vancouver, Wash., company, the projector weights less than 14 pounds and provides 800 by 600 resolution. A video version has a 125-channel cable-ready tuner.

The projector costs$7,690.

Sarif
(360) 750-0242
www.sarif.com

Browser interfaces move beyond the Web

CONTINUED FROM PAGE 41

the Internet. Netscape and Sun, however, are leaning more toward browser technology than desktop and other peripheral applications in their interfaces.

In the coming months, Microsoft will give users the option of a screen that combines the next version of Windows 95, NT 5.0 and Internet Explorer, or of a non-Web screen more like what exists today. Beta versions of these technologies are scheduled for the first quarter.

EASY TO USE

Microsoft will give users the option in new versions of Windows 95 and NT to have a single interface for Web and operating system applications. It promises that users won't need to be trained to use that unified desktop if they are familiar with both interfaces.

For its part, Sun is designating its Hot Java Browser for use with its JavaStation network computers and keeping the browser separate from other desktop functions such as groupware and E-mail. To link desktop applications with a view of the Web and Internet, Sun is providing the Hot Java Viewer for desktop machines.

And Netscape is beta-testing Communicator, its successor to Navigator that combines browser, groupware and E-mail functions into one browser-based interface.

"We want to keep the browser capability stand-alone," said Carole Amos, who heads up Sun's Hot Java department. "For somebody building a kiosk, say, they don't need E-mail or calendars or scheduling."

> "The discussion has to move away from technology and move toward convenience to customers and ease of use."
>
> – Steve Roberts, L. L. Bean

Jerry Michalsi, managing editor of "Release 1.0," a newsletter in New York, said Communicator challenges Microsoft where it is weakest — in groupware and E-mail.

SAVING TIME

Users are emphasizing the importance of making these technologies easy to use. And some said melding the browser into a desktop operating system would save time and frustration.

"The discussion has to move away from technology and move toward convenience to customers and ease of use," said Steve Roberts, senior new media analyst at L. L. Bean, the Freeport, Maine-based outdoor clothing and equipment retailer. "Users want something as simple as a telephone," he said.

"When you're doing stuff on the Web, you might want to go to [a file transfer protocol] site, and you want that integrated," said Dan Mezick, technology trainer at New Technology Solutions in North Haven, Conn.

Mezick said once a user is connected to the Internet, "it would be really convenient" to send E-mail from a Web site. "The browser is starting to become [the] interface to the rest of the world," he said.

And a browser contained within a Windows operating system would ease this process. "If I want tp go explore something, I can. You want to look at all those resources as one thing. . . . I don't have to launch multiple applications. I see browsers as the most important horizontal application," Mezick said.

But Mezick said all of this could take a sharp turn if network computers become a market force.

"If that happens, there will be a sort of unbundling initiative where the browser will be the only thing on the machine," Mezick said. "But let's face it. You'll want E-mail anyway. You'll want to get everything all the time. You'll want all that stuff without thinking about it. Closing one thing and opening another is a sideways step. It slows you down. It interrupts your flow."

Worldwide Sales Information System
Bookings
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Trend Analysis
PHILIPS
PHILIPS

Fast notebooks still in short supply

By Mindy Blodgett

LAPTOP VENDORS are expected to offer bigger screens, faster processors and multimedia chips this year. But what users really want is to get their hands on notebook models that are in short supply.

But that isn't likely to happen soon, industry observers said.

Leslie Fiering, an analyst at Gartner Group, Inc. in Stamford, Conn., blamed the shortages on chip maker Intel Corp. By pushing laptop vendors to release machines with faster chips, Intel forced them to ramp up production in continuous, overlapping cycles without giving them enough time to correctly assess the market demand, Fiering said.

The result: Laptop vendors didn't foresee the unprecedented notebook demand last year, which has led to order backlogs spilling into 1997.

Notebook makers also shoved models out the door before ironing out design issues, which lead to buggy machines.

"Notebooks take more time to design than desktops because you are cramming so much into much less real estate," Fiering said. "You have to make trade-offs in weight, cost, thermal envelope, durability."

Users also said they would like to see power management improvements and more durable external devices.

"I find I spend way too much time dealing with things like broken dongles on modems and cables that break inside PC cards," said George Staton, information systems director at Commerce Bank in Cherry Hill, N.J. "These things should be much more rugged than they are."

But observers said 1997 laptops are more likely to match the following industry trends:

- Lighter and slimmer notebooks. Companies such as Digital Equipment Corp. and IBM PC Co. last year released lightweight computers that proved popular. Expect more of the same. Vendors will increasingly offer "slicing" or "stackables" — removable parts that allow users to add or subtract features.

Staton said his company plans to roll out a sales force automation system, and lighter laptops look more appealing. "Lighter is better," he said.

- Bigger displays, as laptop vendors migrate to 13- and 14-in. screens. The largest screens most vendors currently offer are 11.3 in. or 12.1 in.

"For sales presentations, bigger displays help," Staton said.

- Intel plans to release its Pentium MMX chips for notebooks this month. The chip will support multimedia applications such as videoconferencing on laptops.

The latest

Notebook users not willing to wait for 1997 models can find satisfaction with some releases announced just before the holidays.

New notebooks and price cuts include the following:

- **Compaq Computer Corp. in Houston added two models to its entry-level Armada notebook family. Both feature a 120-MHz Pentium processor, 16M bytes of memory, a 1.08G-byte hard drive and a 10.4-in. screen display. The 1130 Armada has a dual-scan LCD screen, and the 1130T has an active-matrix LCD screen. The models cost between $1,899 and $2,299.**
- **Panasonic Personal Computer Co. in Secaucus, N.J., released CF-25, a rugged, 7-pound Pentium notebook with a waterproof chassis. It costs between $3,329 and $3,869.**
- **WinBook Corp. in Columbus, Ohio, unveiled the entry-level WinBook XP5 Pro. The WinBook XP5 Pro features a 12.1-in., dual-scan screen, a 133-MHz processor, a 1G-byte hard drive and lithium ion batteries. It starts at $2,699 with 16M bytes of RAM. WinBook also released additions to the WinBook FX line, which cost $2,999 to $4,399. The line features 133- to 150-MHz processors, 11.3- to 12.1-in. screens and between 16M and 32M bytes of memory.**

— Mindy Blodgett

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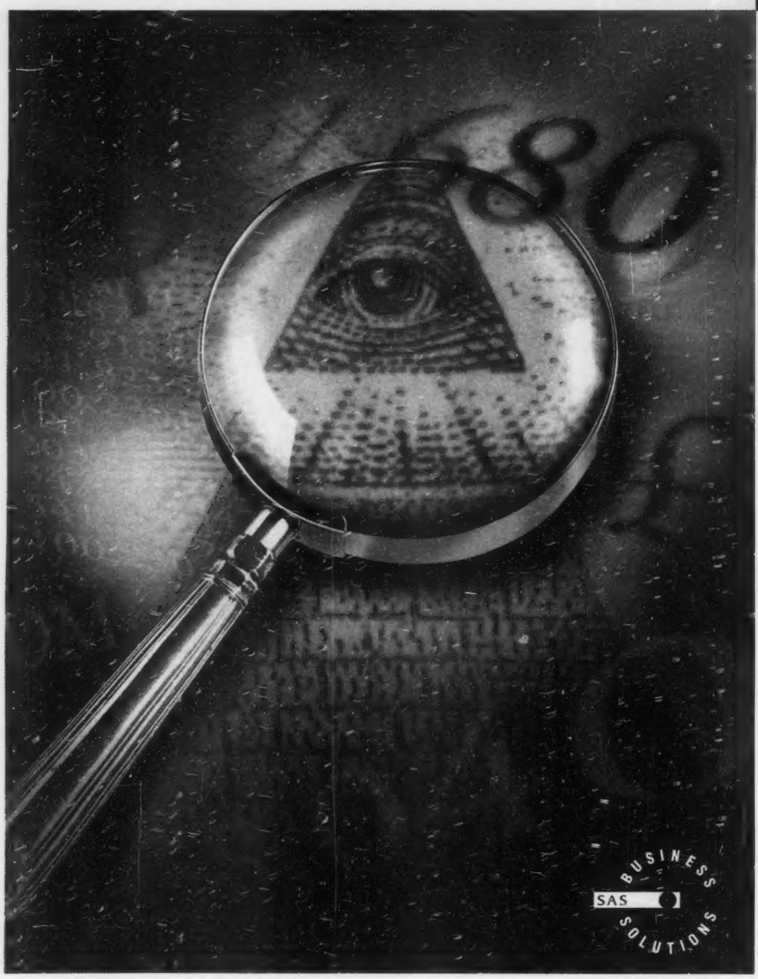
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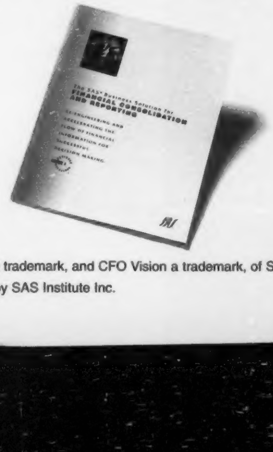


Software

Client/Server ♦ Development ♦ Operating Systems

Briefs

SAP nixes Sybase plan

SAP AG has rebuffed a Sybase, Inc. proposal that the companies work together to enable SAP's R/3 applications to run on Sybase's SQL Server database. Sybase said it will proceed alone with a plan to revamp SQL Server to handle R/3.

Software costs

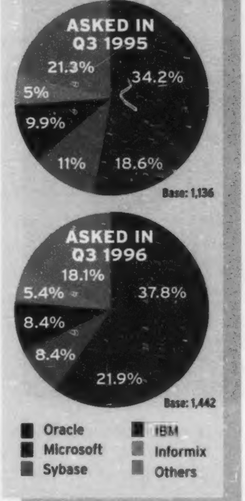
An accounting rule proposed by the American Institute of Certified Public Accountants will let companies spread out the cost of software purchases over several years. The rule could give companies a reason to buy more expensive software, as some buy less expensive packages to avoid recording high expenses.

PL/1 to end millennium

Micro Focus, Inc. in Palo Alto, Calif., has been shipping a PL/1 language extension for its Revolve/2000 millennium programming tool. The software, available on Windows 3.x, Windows NT and Windows 95, costs $1,500 per user.

WHO YA GONNA CALL?

Whom do you expect to be your primary database vendor in the future?



Source: Computerworld Information Management Group, Framingham, Mass.

Mainframe, Web nuptial lauded

▸ *Microsoft, Proginet deal enhances access*

By Laura DiDio

USERS AND ANALYSTS applauded a recent deal between Microsoft Corp. and Proginet Corp. to meld World Wide Web-based applications with mainframe-based data.

Observers said the pact will help Microsoft keep pace with competitors Netscape Communications Corp. and Sun Microsystems, Inc., which have made similar moves in recent months to marry the Web and mainframe worlds.

Multicare's Tony Macaluso says "everyone" is headed toward linking Web applications with mainframes

As part of the Dec. 17 deal, Proginet will include its TransAccess middleware in a HostOffice software suite. TransAccess enables the integration of applications that run on the MVS mainframe operating system and other client/server applications with Windows NT-based applications. HostOffice also includes several other network-to-mainframe automation utilities for network managers.

BETTER INTEGRATION

The HostOffice software, when combined with Microsoft's SNA Server package, enhances integration among Web-based applications that run on the Windows NT Server platform and applications and data on mainframes and midrange systems, said Mike Nash, Microsoft's director of marketing.

Microsoft acquired an undisclosed minority stake in Garden City, N.Y.-based Proginet.

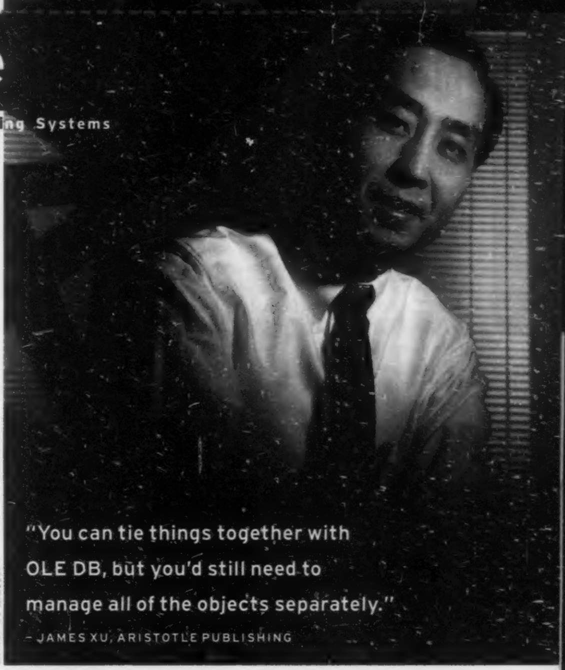
The approach linking Web applications to mainframes is "definitely a must-do item, since everyone — vendors and users alike — [is] headed in this direction," said Tony Macaluso, director of information technology at Multicare Cos., a health care firm in Hackensack, N.J.

Multicare, which has 3,000 users at 165 locations nationwide, wants to deploy this type of technology to give its outside customers and alliance partners secure, monitored access to the company's corporate intranet.

"We're already in the process of using intranet and Internet Web-based technology to access our Oracle corporate databases running on Windows NT Server. Now that Microsoft is in the game, we'll look at their combined offering with Proginet as well," Macaluso said.

Dan Schuffert, a senior systems programmer at a Chicago paper manufacturer, said deliv-

Microsoft, page 48



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– JAMES XU, ARISTOTLE PUBLISHING

KATHERINE LAMBERT

MICROSOFT SQL SERVER

Object links may sap speed

By Craig Stedman

MICROSOFT CORP.'s plan to let its SQL Server database reach out and touch multimedia data stored elsewhere is an interesting twist on the idea of object-enabling databases, according to users and industry analysts. But some said it also comes with potential flaws.

For object-based applications that need to access information in spreadsheets or other native file systems, Microsoft's leave-the-data-where-it-lies approach might be less disruptive than the database-centric strategies of vendors such as Informix Software, Inc. and Oracle Corp., several users said.

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SQL Server, page 50

Easing the mainframe data migration

By Tim Ouellette

TWO NEW PRODUCTS are an attempt to simplify how users move data from their mainframe systems to the client/server world without altering the data.

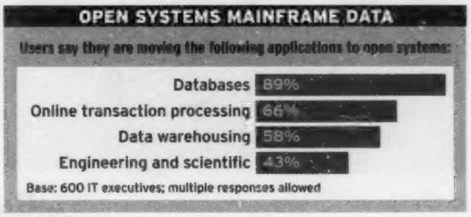
Liant Software Corp.'s Relativity for MVS, due to ship this quarter, maps MVS VSAM data into a relational database that can then be accessed via popular Windows desktop applications — without having to reprogram the Cobol applications. Austin, Texas-based Liant has shipped previous versions of Relativity on other platforms.

The other package, Micro Tempus, Inc.'s TCS 2.2, acts as a traffic cop, moving data files among platforms and protocols while providing development tools, for example, to handle

Mainframe, page 48

OPEN SYSTEMS MAINFRAME DATA

Users say they are moving the following applications to open systems:



Base: 600 IT executives; multiple responses allowed

Source: Find/SVP, New York

Software

Client/Server • Development • Operati Systems

Briefs

SAP nixes Sybase plan

SAP AG has rebuffed a Sybase, Inc. proposal that the companies work together to enable SAP's R/3 applications to run on Sybase's SQL Server database. Sybase said it will proceed alone with a plan to revamp SQL Server to handle R/3.

Software costs

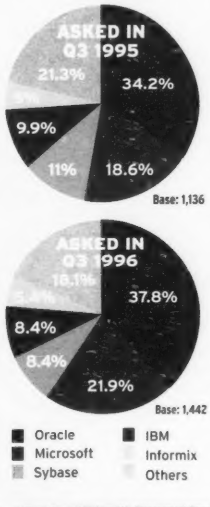
An accounting rule proposed by the American Institute of Certified Public Accountants will let companies spread out the cost of software purchases over several years. The rule could give companies a reason to buy more expensive software, as some buy less expensive packages to avoid recording high expenses.

PL/1 to end millennium

Micro Focus, Inc. in Palo Alto, Calif., has been shipping a PL/1 language extension for its Revolve/2000 millennium programming tool. The software, available on Windows 3.x, Windows NT and Windows 95, costs $1,500 per user.

WHO YA GONNA CALL?

Whom do you expect to be your primary database vendor in the future?



Source: Computerworld Information Management Group, Framingham, Mass.

Mainframe, Web nuptial lauded

▸ *Microsoft, Proginet deal enhances access*

By Laura DiDio

USERS AND ANALYSTS applauded a recent deal between Microsoft Corp. and Proginet Corp. to meld World Wide Web-based applications with mainframe-based data.

Observers said the pact will help Microsoft keep pace with competitors Netscape Communications Corp. and Sun Microsystems, Inc., which have made similar moves in recent months to marry the Web and mainframe worlds.

Multicare's Tony Macaluso says "everyone" is headed toward linking Web applications with mainframes

As part of the Dec. 17 deal, Proginet will include its TransAccess middleware in a HostOffice software suite. TransAccess enables the integration of applications that run on the MVS mainframe operating system and other client/server applications with Windows NT-based applications. HostOffice also includes several other network-to-mainframe automation utilities for network managers.

BETTER INTEGRATION

The HostOffice software, when combined with Microsoft's SNA Server package, enhances integration among Web-based applications that run on the Windows NT Server platform and applications and data on mainframes and midrange systems, said Mike Nash, Microsoft's director of marketing.

Microsoft acquired an undisclosed minority stake in Garden City, N.Y.-based Proginet.

The approach linking Web applications to mainframes is "definitely a must-do item, since everyone — vendors and users alike — [is] headed in this direction," said Tony Macaluso, director of information technology at Multicare Cos., a health care firm in Hackensack, N.J.

Multicare, which has 3,000 users at 165 locations nationwide, wants to deploy this type of technology to give its outside customers and alliance partners secure, monitored access to the company's corporate intranet.

"We're already in the process of using intranet and Internet Web-based technology to access our Oracle corporate databases running on Windows NT Server. Now that Microsoft is in the game, we'll look at their combined offering with Proginet as well," Macaluso said.

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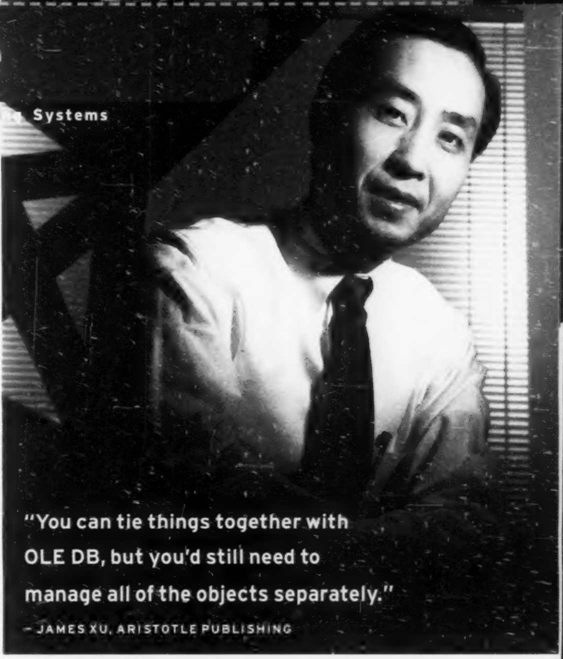
Microsoft, page 48



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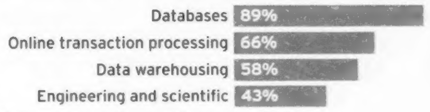


Source: Find/SVP, New York

Mainframe migration

CONTINUED FROM PAGE 47

how clients access and use data that resides on a specific mainframe.

"For companies with a large investment in Cobol code, the expense of rewriting code [to convert mainframe data to client/server format] is tremendous," said Jim MacDonald, president of JA MacDonald Consulting in Dallas.

GOING NOWHERE

On a previous job at a company that was redesigning its mainframe bank processing application as an open system, MacDonald worked for more than three years without success.

'There is a whole lot of data still controlled by mainframe-based Cobol applications," said Evan Quinn, an analyst at International Data Corp. in Framingham, Mass. "But now interest in data warehousing shows a desire to get that data to specific areas for manipulation."

MacDonald sees Relativity as a migration tool to get from mainframe to client/server systems.

That is because client/server relational databases can handle ongoing banking transactions during the day. But then users can keep their Cobol applications at day's end to do the heavy lifting, such as batch posting the enormous number of daily banking activities.

> TCS lets users move data across the WAN at a time convenient to the receiving end.

Users of Micro Tempus' TCS said its ability to mix ad hoc and scheduled data transfers gives them flexibility, especially in global companies.

"We need to be able to move data from the mainframe to servers, and we need to get it from places like Houston to Leeds or Singapore," said Greg Johnson, manager of information systems administration at Cooper Cameron Oil Corp. in Houston.

Users must move data from Cooper's mainframe-based SAP R/2 applications to 70 distributed servers for reporting purposes, Johnson added.

More important, TCS lets users move data across the wide-area network at a time convenient to the receiving end — taking into account when London or another foreign office is off-hours.

TCS 2.2, due this month, will allow data administrators to manage the TCS services from Java-based World Wide Web browsers, though users may be more concerned with getting the job done on their existing platforms first.

"We are looking at TCS for internal use now, but once we create our data warehouse, we may have users access data via Java," Johnson said.

Relativity for MVS lets one client application access legacy data over SNA or TCP/IP networks. Pricing starts at $37,000.

Microsoft, Proginet agreement

CONTINUED FROM PAGE 47

ering better access to mainframe and AS/400 data from Web browsers eliminates the need to install application software on each client used to access corporate data.

Macaluso agreed, adding that using a Web browser rather than a workstation-based application to access corporate intranet data gives his company "much more flexibility."

EASY SHARING

"It means our customers and alliance partners can share information and access our databases without having to be a peer on our network. The browser technology becomes the client, and we still retain control over access to the data," Macaluso said.

Bob Sakakeeny, an analyst at Aberdeen Group, Inc. in Boston, said this type of offering will become commonplace within the next year. "Everyone is looking for ways to expand their Web use and make the Web work for them. This definitely provides a clear-cut advantage to businesses. Microsoft and Proginet are right on target though they've got plenty of competition," Sakakeeny said.

Under the terms of the Microsoft/Proginet deal, Proginet will provide all technical support for its HostOffice Suite. It has also developed a Web-based customer support system called Proginet Oasis, based on Microsoft's Internet technology.

> **"The browser technology becomes the client, and we still retain control over access to the data."**
> **– Tony Macaluso, Multicare**

FRANKLY SPEAKING

Year 2000 scare tactics

FRANK HAYES

Does the year 2000 problem scare you?

I don't mean, "Does it make you concerned or give you pause?" I mean, "Does it *scare* you?" Does it make your stomach tighten and your hands shake? Does it shorten your breath and send adrenaline pounding through your veins?

And more to the point, does it scare your CEO?

It isn't too late to solve your company's year 2000 problem. And if you're reading *Computerworld*, you *do* have a year 2000 problem, even if there isn't a mainframe in sight.

You've heard about all the old Cobol programs with two-digit year fields that have to be retrofitted to handle 99 clicking over to 00. But there are lots of other pieces to the year 2000 puzzle. You'll need to upgrade PCs, fix your client/server applications and coordinate changes with your business partners.

It's a big project, and you won't even know *how* big until you finish the planning stage. And that's a big project in itself because it requires reviewing every piece of computer hardware and software in your company — including some you don't even know about today.

But you can't do it in time without the full and active support of your CEO and top managers. And this is one time they won't want to sign on.

Why not? Because unlike client/server, intranets and all the other hot technology projects your department has pitched to upper managers over the years, this one has no return on investment. You can't project improved productivity or lower costs from a year 2000 project.

The only payback is that you get to stay in business.

Really. That's it. It will cost a lot of money, it's got an absolute deadline that can't be slipped, it's as unsexy a project as you'll ever have to do. And it offers nothing attractive whatsoever — except corporate survival.

So how do you get the big bosses to get behind a big, ugly, expensive, zero-return-on-investment project? There's only one way. You've got to scare the pants off them.

That doesn't require a Stephen King or Clive Barker. You don't have to dream up a terrifying monster lurking just ahead — you've already got that.

With luck, all you really need to do is marshal the facts — they're scary enough. Calculate the number of your machines and programs that have to be fixed and what the cost will be when they fail. Point out that your competitors are spending big bucks on their year 2000 fix, too.

Don't forget to mention that if your systems crash and your company burns because of the year 2000 bug, shareholder lawsuits will probably hold directors and upper managers personally responsible.

In other words, they can get sued, too.

Puncture the myths: There's no chip that will solve the problem, no magic bullet for a quick fix. There isn't enough time to combine this project with system enhancements or routine maintenance. There's no way out except an expensive, zero-benefit bug fix.

One last thing. When they ask, "How did this happen?" (and they *will* ask that), tell them the truth: Two-digit dates were the least expensive, most cost-effective way to store data. They were standard industry practice.

Now *that's* scary.

Hayes is Computerworld*'s staff columnist. His Internet address is frank_hayes@cw.com.*

SHORT

Middleware-speak

Level 8 Systems, Inc. is beta-testing its Falcon gateway, which lets Microsoft Corp.'s Falcon message-queueing middleware speak with IBM's MQSeries middleware and mainframe and Unix systems. The New York company is working with Microsoft and IBM to make sure communications are smooth between the two environments. The gateway is due when Microsoft is scheduled to ship Falcon, early this year.

SQL Server interface

CONTINUED FROM PAGE 47

management headaches.

James Xu, vice president of technology at Aristotle Publishing, Inc. in Washington, said relocating complex data such as images and text from desktop applications to a database would require "a huge investment." Storing objects locally also should give users at the company's remote offices in Georgia and California faster access to that particular data, he said.

But managing scattered objects "could be a nightmare for me," Xu said. "If you put everything in a central [database], it can take care of all that for you."

Passing objects back and forth across a network also might eat up bandwidth, he said. Aristotle uses Microsoft's SQL Server to store a voter information database that it sells to elected officials and candidates.

Microsoft's plan, which was outlined last month, is built around its new OLE DB data access interface. OLE DB support is being built in to the next version of SQL Server, code-named Sphinx and due in the second half of this year. That will let SQL Server tap into external data sources that also have been tied to the OLE DB interface.

REACHING OUT

Microsoft is adding OLE DB support to its desktop applications and lobbying other software vendors to embrace the interface, which conforms with its OLE Integration architecture for linking different applications together.

Meanwhile, SQL Server's limited support for storing text and basic binary objects will be enhanced in the Sphinx release.

"But we're not going to make a wholesale sort of switch to an object/relational database," said product manager Dan Basica.

OLE DB is a "politically correct" alternative to the database-centric approaches that Informix and Oracle are taking, said Wayne Eckerson, an analyst at Patricia Seybold Group in Boston. However, network bandwidth and reliability issues could make it "more suitable for less mission-critical applications," he added.

On the other hand, spreading data around would let users continue to work if the central database went down, said Larry Joseph, a consultant who built a distributed network using SQL Server at the Texas Department of Public Safety in Austin.

But keeping the dispersed objects synchronized "is a trick," Joseph added. The department is writing its own code to automate management steps that it hopes will be handled by OLE DB in the future, he said.

NEW PRODUCTS

TECA, INC. has announced Teca Custom Controls for the AS/400 Version 2.0, a set of OLE controls.

According to the Portland, Ore., company, Teca Custom Controls can develop 32-bit client/server applications with no low-level coding.

Pricing starts at $495 for a package of six OLE controls.

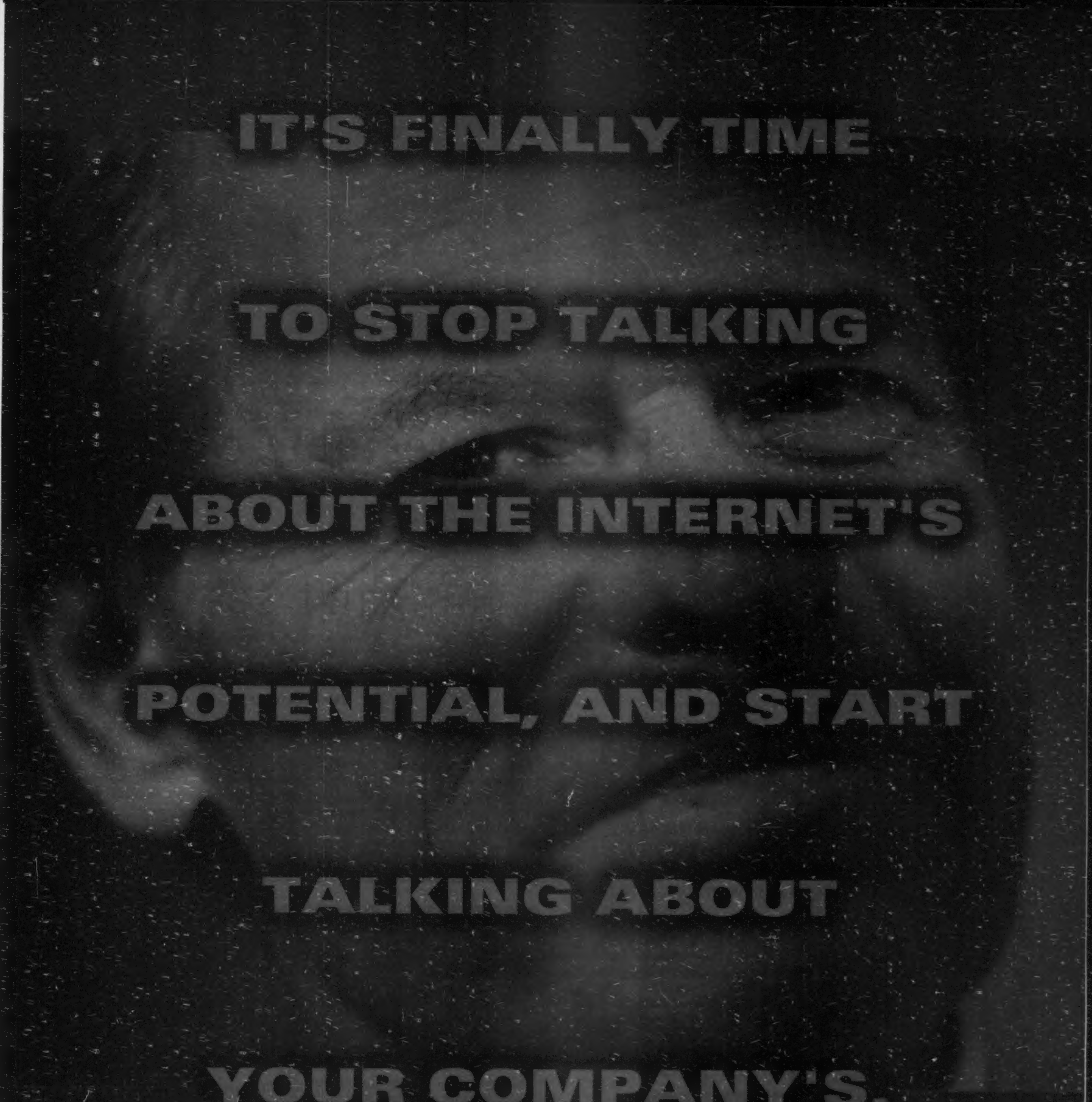
Teca
(503) 761-9438
www.teca.com

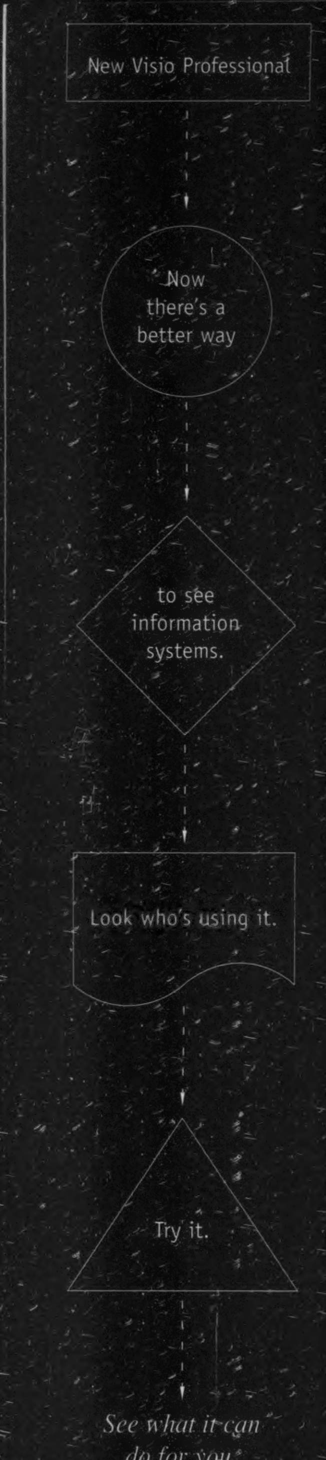
MCAFEE NETWORK SECURITY & MANAGEMENT has announced SaberTools SMS, tools to enhance the functionality of Microsoft Corp.'s Systems Management Server.

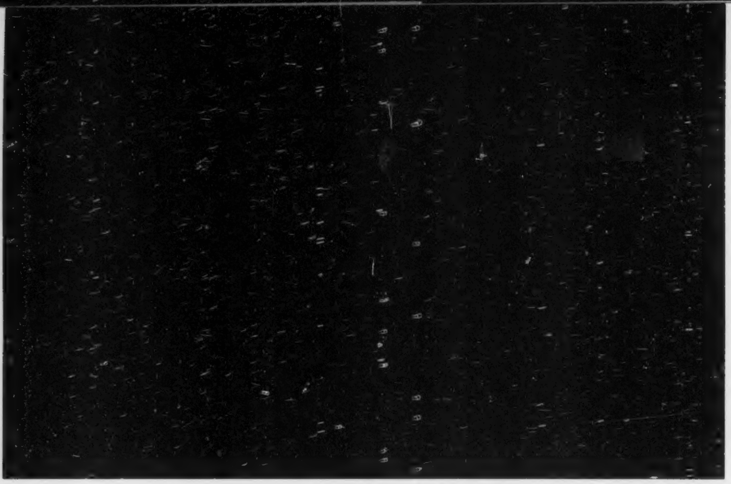
According to the Santa Clara, Calif., company, SaberTools provides software metering, desktop menu management and automated generation of software distribution scripts.

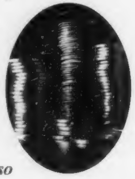
Pricing starts at $30.70 per node for 100 nodes.

McAfee Network Security & Management
(408) 988-3832
www.mcafee.com


IT'S FINALLY TIME
TO STOP TALKING
ABOUT THE INTERNET'S
POTENTIAL, AND START
TALKING ABOUT
YOUR COMPANY'S.







The Enterprise Network

LANs • WANs • Network Management

Briefs

Secure NT migration

Houston-based Mission Critical Software, Inc. recently shipped systems management software to help large organizations distribute security tasks among administrators of NT servers. Enterprise Administrator creates a hierarchy that divides a network's large Windows NT domains into smaller territories that match organizational structure. In each territory, deputized Windows NT users can perform routine chores such as resetting passwords and granting access to resources. The tool augments Windows NT security by enforcing naming conventions and tracking user logins for audits. Enterprise Administrator costs $900 per managed domain plus $14 per user account defined in those domains.

Management module

Start-up MainControl, Inc. in Vienna, Va., has added a module to its MC/EMpower systems management suite. The tool, called Chronicle, automatically tracks modifications to all hardware and software regardless of operating system, protocol or location on the network. Managers can run the tool by itself or along with other tools from MainControl.

PUBLIC NETWORKS

"The public switched telephone network is the wrong place to be doing data services. Period."

– Robert Moskowitz, technical support specialist, Chrysler Corp., who advocates using wireless and other technology to relieve congestion on public telephone switches.

Vendors set to give LDAP directories a boost

▸ *Firms developing complement to specification*

By Barb Cole

THE EFFORTS OF several key messaging vendors are expected to greatly improve the usability of directories based on Lightweight Directory Access Protocol (LDAP).

Several messaging heavyweights are developing a specification, dubbed Lightweight Internet Person Schema (LIPS), for retrieving information such as names and electronic-mail addresses across LDAP directories.

LDAP has been hot since Netscape persuaded several companies to rally around the spec last year. But LDAP was actually created more than seven years ago at the University of Michigan, where more than 50,000 end users exploit an LDAP-based directory.

EASING THE WAY

The combination of LDAP-compliant directories and the LIPS spec could make it easier for companies to glean consistent information across the many directories they maintain as part of their network operating systems, E-mail packages and database applications.

"We are in directory hell right now," said Larry Gauthier, director of operations management at the information technology division of the University of Michigan in Ann Arbor. "We have zillions of directories that don't talk to [one another] and arcane ways of synchronizing them."

Gauthier is also past chairman of the Network Applications Consortium (NAC), a user and vendor group that works to promote interoperability among networked applications and is coordinating development of LIPS.

The companies behind the LIPS effort, which include Microsoft Corp., Netscape Communications Corp., Novell, Inc., IBM, Lotus Development Corp., Banyan Systems, Inc., Worldtalk Corp. and Zoomit Corp., are developing a

LDAP directories, page 54

Kmart jumps on frame relay

By Thomas Hoffman

TRYING TO TAKE advantage of the relatively low cost of frame-relay wide-area connections, Kmart Corp. recently began installing frame-relay connections throughout its network of North American distribution centers.

The effort marks the start of a yearlong plan to install frame relay at all of the $34.4 billion discount retailer's 2,161 stores and speed data communications while continuing to rely on VSAT satellite communications for voice and broadcast.

The frame-relay project is one of several information technology initiatives that the Troy, Mich.-based retailer has launched in recent months to help cut costs, streamline the flow of information and compete more effectively against rival Wal-Mart Stores, Inc. [CW, Dec. 16].

Kmart has resuscitated plans to migrate its satellite network to frame relay. That will allow the company to move data to its stores faster over TCP/IP rather than with IBM's SNA.

Frame-relay prices "have been dropping, and I'm delighted that I waited a year," said Donald Norman, chief information officer at Kmart.

Kmart installed its VSAT network in 1986. This means it has already completed its five- to seven-year capital equipment expenditures for VSAT gear and can install the frame-relay equipment with little or no capi-

Kmart, page 54

WHY NOT?

Users' reasons for not implementing Ipsilon's IP Switching and Cisco's Tag Switching

1. Technologies not mature
2. No standards exist
3. Vendor battles and hype
4. Networks not yet congested
5. No immediate business benefit
6. Service providers more of a target
7. Fear of being on bleeding-edge

• Despite hype, users snub schemes

IP switching on hold

By Bob Wallace

BOXING PROMOTER Don King probably would be impressed by the level of hype surrounding fast Internet Protocol (IP) switching schemes, but many users don't plan to implement them any time soon.

Fast IP switching allows users to boost the performance of their existing router-based IP networks by adding switching.

It sounds attractive enough, but users are holding off largely due to the immaturity of the technology and because they haven't yet hit a performance wall with their current networks. And there is no standard in sight.

GUESSING GAME

Analysts wouldn't guess when a standard for fast IP switching might be approved, though Ipsilon Networks, Inc. has been shipping its package since April.

"How could any user implement one of these approaches until there's a standard that's backed?" asked John Scoggin, chief technical advisor at DelMarva Telecommunications, Inc., a unit of DelMarva Power & Light in Newark, Del. "It'd certainly be a very risky proposition. Do we have a plan to implement it? Absolutely not for the next 18 months, at which time we'll reexamine the situation."

The market is made up of two key players — start-up Ipsilon in Sunnyvale, Calif., with its IP Switching product and Cisco Systems, Inc. in San Jose, Calif., which has developed Tag Switching, a rival scheme that won't be generally available until the second half of this year. Fur began to fly as the two battled for industry support for their proposed approaches in the past few months.

IP switching, page 54

Snapshot

CALL ME ANYTIME

Facts about telephone lines used for online access

6 million phone lines, or 5.5% of all phone lines, are used exclusively for Internet access.

Bell company revenue from second lines to residences reached $3.4 billion between 1990 and 1995.

One-third of the $90 billion local market comes from access fees long-distance companies pay the Baby Bells.

Source: The Internet Access Coalition and the Federal Communications Commission

Snapshot

LAN COST OF OWNERSHIP

A Business Research Group survey assessed overall cost of ownership for three networks based on ease of use, time required to perform specific tasks and cost of LAN administration. The survey evenly sampled managers of clients and servers based on IBM OS/2 Warp Server, Microsoft Windows NT Server and Novell NetWare. Here are some of the results:

	Small sites (less than 100 servers)	Large sites (more than 100 servers)
Windows NT Server		
Per server	$10,167	$4,076
Per client	$1,017	$123
NetWare		
Per server	$11,729	$4,839
Per client	$757	$202
OS/2 Warp Server		
Per server	$8,310	$3,584
Per client	$782	$53

Base: 240 LAN administrators

Source: Business Research Group, Newton, Mass.

IP switching schemes

CONTINUED FROM PAGE 53

The Ipsilon package costs around $45,000. The schemes could also involve special staff training.

The Internet Engineering Task Force (IETF) is assessing the competing approaches. While not a standards-setting body, the IETF makes recommendations that are often implemented in networking products.

Analysts expect that Ipsilon's IP Switching and Cisco's Tag Switching will be implemented first by carriers and other service providers, not large users.

"We don't plan to use them in the next 18 to 24 months," said Mark Maxwell, vice president of global systems management at Fuji Capital Markets Corp. in New York. In the meantime, he is implementing 100M bit/sec. Fast Ethernet to boost network performance.

"These approaches are most useful to [Internet service providers] and carriers as their networks are far more congested than user networks," said Eric Hindin, an analyst at The Yankee Group, Inc., a consulting and research firm in Boston. "I don't think [the schemes] will have a significant impact in the industry for at least a year. I think the number of users even considering these is very small."

But if Internet service providers and carriers implement the technology, that could mean fewer service outages and interruptions due strictly to heavy traffic volumes. Countless Internet providers rely on router-based networks.

Although many large users have no near-term plans for IP Switching or Tag Switching, they aren't ignoring it.

"It's something we're looking at [as a future technology]," said Steve Fall, who works on NASA's wide-area network in Huntsville, Ala. "We see Cisco Tag Switching as more alluring as it goes beyond IP Switching and supports multiple protocols."

Fall said that is important since NASA's network supports IP, Novell, Inc.'s IPX, Xerox Corp.'s XNS, Apple Computer, Inc.'s AppleTalk and Digital Equipment Corp.'s DECnet.

LDAP directories to get boost

CONTINUED FROM PAGE 53

specification to complement LDAP.

LDAP-compliant directories are still scarce today, but most messaging vendors have pledged support for the protocol. Zoomit and Netscape are among the vendors that have recently shipped LDAP-compliant directories.

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Gauthier said despite the support for LDAP, interoperability wasn't assured prior to the LIPS effort. That is because although LDAP offers a common protocol for accessing directories, it doesn't ensure that the information will be in a consistent spot in the directory or in a common format. So users could have difficulty locating the correct information from LDAP directories or cull information in an unfamiliar format.

LIPS will probably include about 20 attributes — such as name, E-mail address and telephone number — that spell out how specific pieces of address information are stored in an LDAP directory. Then users will be able to retrieve this information in a consistent way across directories.

"This effort could prove very useful, especially for companies that do Internet commerce and need to connect their directories to other companies' [directories]," said Alexis Bor, vice chairman of the Electronic Messaging Association's directory committee, and a former information systems staffer at The Boeing Co. in Seattle.

The NAC expects to submit LIPS to the Internet Engineering Task Force for consideration as an Internet standard. Work on the spec could be completed as early as this month, and products that support the spec are expected early this year.

The spec won't solve all the issues surrounding directory compatibility, vendors involved with the effort said. For example, it won't handle replication of data between directory servers, which lets users reduce the cost and administrative hassles of maintaining several directories by building a master, or meta, directory.

Kmart jumps on frame relay

CONTINUED FROM PAGE 53

tal outlay, said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington.

Satellite communications was more economical than land-based lines 10 years ago, when terrestrial communications costs were skyrocketing and costs to support VSAT were 30% to 45% cheaper, said Tom Nolle, president of CIMI Corp., a strategic planning consultancy in Voorhees, N.J.

Today, frame relay is considered 10% to 20% less expensive than VSAT partly because customers don't have to worry about uplink costs, analysts said.

HOLDING ON TO VSAT

Kmart expects to retain VSAT voice and broadcast for the next few years because the company has a contractual agreement with a VSAT provider through 1999.

Norman wouldn't name the frame-relay vendor whose technologies are being used in half of Kmart's distribution centers. That is because Kmart is bidding out a frame-relay contract for its stores for next year, Norman said.

Kmart expects to complete its rollout of frame relay to its remaining distribution centers in January.

NEW PRODUCTS

MICROSTAR LABORATORIES, INC. has announced DAPcell software for use in distributed intelligent data acquisition and process control uses on industrial networks.

According to the Bellevue, Wash., company, a network that is dedicated to data acquisition and control may include as many DAPcell PCs as needed to provide supervisory control for DAP boards and I/O.

Pricing starts at $995.

Microstar Laboratories
(206) 453-2345
www.mstarlabs.com

MTX INTERNATIONAL, INC. has announced MTX Enterprise Accounting software for Microsoft Office.

According to the Englewood, Colo., company, MTX Enterprise Accounting includes general ledger, accounts payable and accounts receivable software for Windows 95 or Windows NT 4.0.

Pricing starts at $3,995.

MTX International
(303) 770-9840
www.mtxi.com

INSIGNIA SOLUTIONS, INC. has announced SoftWindows 95, which lets users run Windows 95 applications on Silicon Graphics, Inc. workstations.

According to the Santa Clara, Calif., company, SoftWindows 95 has Windows 95 installed and ready to run. It also includes multimedia support .

The product costs $299.95.

Insignia Solutions
(800) 848-7677
www.insignia.com

TEKRAM TECHNOLOGY CORP. has announced Tekram Infranet, wireless devices that use infrared beams to replace cable connections among desktop and notebook computers, servers and printers.

According to the Austin, Texas, company, the product line was designed to allow connections in LANs without ripping up flooring or tearing in to ceilings. Products include the IRnet IR-610, which combines a small network interface unit with an IRmate infrared adapter.

The IR-610 costs $200. Other products start at $50.

Tekram Technology
(512) 833-6550
www.tekram.com

AMERICAN INTERNATIONAL FACSIMILE PRODUCTS, INC. has announced WorkPak 2.0, software for high-volume faxing from the network.

According to the Portland, Ore., company, WorkPak 2.0 provides departmental managers with electronic-mail-based fax integration with Notes and other major E-mail systems.

Pricing for one component of WorkPak 2.0, called NetLink Pro, starts at $1,995.

American International
Facsimile Products
(800) 600-4FAX
www.aifp.com

The Internet

The World Wide Web • Intranets • Online Services

Briefs

Thrifty boosts Web site

Thrifty Rent-A-Car System, Inc. last month launched a new feature on its World Wide Web site that allows consumers and travel agents to reserve a car and receive immediate confirmation over the Internet from anywhere in the world.

Once the user logs on to the Thrifty Web site (www.thrifty.com) and the proper information is entered in the reservation section, the site provides the customer a rate and confirmation number and any applicable information related to the rental.

Netscape gets database

Netscape Communications Corp. has licensed Object Design, Inc.'s lightweight Java-based database and plans to bundle it with its Netscape Communicator, a client package that combines electronic mail, groupware, Web browsing and other functions.

Online cash

Looking for some quick cash? Beneficial National Bank in Wilmington, Del., and CompuServe Corp. last week introduced On-Line Loan, an electronic lending system that is touted to grant up to $10,000 in unsecured personal loans in less than two minutes. If approved, a check is mailed the next business day.

A WIRED WORLD

- The number of online households worldwide will grow from 23.4 million in 1996 to 66.6 million by the year 2000.
- Wired households in North America will grow from 15.4 million to 38.2 million in 2000.
- In 1996, 62.8% of the worldwide wired households were in the U.S. By 2000, that number will drop to 54.1%.

Source: Jupiter Communications, New York

Community intranet gets real-world test

By Gary H. Anthes
CELEBRATION, FLA.

EVERY DAY AT Scott Biehler's home, a PC dials up AT&T and transmits a record of everything the Biehler family has done on its PC, fax machine, telephone, cellular phone and pager during the previous 24 hours.

A rogue program planted by a hacker to spy on the Biehlers? No, it's part of a 300-family "living laboratory" set up by AT&T Corp. in Celebration, Fla., to learn how households use computer and communications equipment and services.

Celebration is being built by The Walt Disney Co. on 4,900 acres near the company's Magic Kingdom south of Orlando. Swamps and farmland just two years ago, Celebration was officially dedicated Nov. 18, Mickey Mouse's 68th birthday.

AT&T is just one of many organizations — including city planners, builders, retail chains and schools — that are keeping a close watch on the trend-setting community.

AT&T, for example, will use its Celebration panel to "develop a profile of consumer wants and needs to help us shape the next generation of technology," said Barbara Hisiger, director of the Celebration Project for AT&T.

The real-world test is turning up some surprising findings, Hisiger said. For example, some people with fax machines — provided free by AT&T — said they never thought they would use those devices at home but now claim they can't live without them, she said.

Disney's new town: Celebration, Fla.

The 20,000 people who will live in this planned community will test how intranets may change work and personal lives

Community intranets, page 56

Technology lets Web sites get 'pushy'

▸ *Instead of waiting for visitors, sites send information directly to desktops*

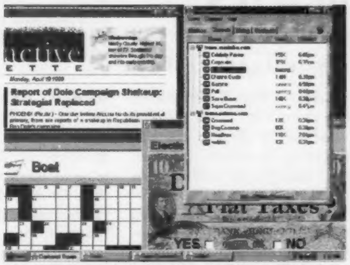
By Mitch Wagner

A NEW MEDIUM with the ungainly name of "push-oriented technology" has the promise to built assertiveness in to pages on thė World Wide Web.

Currently, even the most sophisticated, multimillion-dollar sites sit meekly on the Web, just waiting for users to go to them. But push-oriented technology allows webmasters to make their sites more aggressive by beaming information directly to users' desktops.

"This is a suite of technologies that allows users to say, 'I want to receive information from you,' and then to receive it automatically," said Larry Lozon, senior vice president and director of General Motors Corp.'s Cyberworks business unit in Detroit. "Up until now, users had to take action to go to a Web site."

Cyberworks has been testing a push-oriented tool kit from BackWeb Technologies in San


Report of Dole Campaign Shakeup: Strategist Replaced

Marimba's push technology will be built in to Netscape's new client software, Constellation

Web sites, page 57

Web hack attacks bring down servers, but businesses stay

By Mitch Wagner
and Kim Girard

DESPITE RECENT hacker attacks that knocked out World Wide Web servers in California and New York, businesses on the Internet remain committed to staying there.

They said they already knew doing business on the Internet is dangerous.

"If you have a storefront, someone can come in with a gun and hold you up," said David Rae, CEO of Attitude Network Ltd. in Naples, Fla., which uses UUnet Technologies, Inc. as an Internet service provider. "Certainly there's a risk of this happening from time to time, but I don't think it's an overpowering risk."

The most recent high-profile hacker attacks involve a method known as "SYN flooding."

An unknown hacker using the technique brought down the Web server at Internet service

Hack attacks, page 57

Win 3.1 users must pay for Java support

By Justin Hibbard

WINDOWS 3.1 SHOPS find themselves torn between a $49.95 browser that supports Java and a free browser that supports nearly everything else.

Microsoft Corp. recently released Internet Explorer 3.0 for Windows 3.1, the first Microsoft browser for Windows 3.1 that supports frames, tables and Netscape plug-ins.

BROWSER BATTLES

Those features are already supported in Netscape Communications Corp.'s Navigator 3.0 for Windows 3.1. But unlike Navigator, Internet Explorer is free.

However, the new version of Internet Explorer lacks support for Java. Microsoft has promised to add the missing feature soon, but Netscape has already released its first version of Navigator 3.0 for Windows 3.1 with support for Java.

Both vendors' offerings are intended to capture a share of the massive installed base of Windows 3.1 users. Gartner Group, Inc. in Stamford, Conn., estimates that more than 200 million units of Windows 3.1 are installed worldwide.

Win 3.1, page 56

INTERNET SERVICE PROVIDERS

Trend to nix flat-rate service not expected

By Kim Girard

NETCOM ON-LINE Communication Services, Inc. may be dropping its flat-rate monthly pricing scheme, but don't expect other leading service providers to follow suit.

Netcom officials said the company couldn't sustain its services by charging $19.95 per month. The San Jose, Calif.-based provider plans to raise prices, though rates haven't been set, and will target customers who use the service entirely or partly for business.

The company will continue flat-rate pricing for current customers for an undetermined time.

Netcom's move probably isn't "a sign of a trend," said Ross Rubin, group director of Internet technologies at Jupiter Communications, a consultancy in New York.

"Other [service providers] are prepared to go lower than [$19.95]," he said. They will do so through the subsidization of larger corporate clients, increased advertising and value-added service offerings, Rubin said.

Tom Earl, network manager at Coast to Coast Telecommunications, a Michigan-based telecommunications company that provides Internet access, said he expects many smaller Internet service providers to fold or consolidate under financial pressure this year.

Netcom was the first online provider in its class to abandon flat-rate monthly pricing

"They won't have the funds to keep up with their users," said Earl, whose company charges $30 per month for unlimited service.

America Online reluctantly adopted a $19.95 flat rate for unlimited use in November, drawing a host of new users to its service and prompting existing customers to spend longer periods clogging the online service.

"People don't pay for what they use," said Matthew Cutler, president of the Webmasters Guild. Cutler said he believes the industry will see price changes that reflect usage within the next two years.

For Robert Moskowitz, technical support specialist at Chrysler Corp. in Auburn, Mich., an industrywide usage-based price hike might be a welcome scenario.

Such an increase would lead users to seek new technologies — such as wireless — that will help move Internet traffic off the congested switched public telephone network.

NEW PRODUCTS

SECURITY DYNAMICS TECHNOLOGIES, INC. has announced that its SecurID and ACE/Server software products will operate with Raptor Systems, Inc.'s Eagle NT firewall.

According to the Bedford, Mass., company, network managers will be able to protect their Windows NT networks against unauthorized Internet access by easily integrating Eagle NT with the security products.

Prices for ACE/Server start at $2,450; and at $34 for SecurID.

Security Dynamics Technologies
(617) 687-7000
www.securid.com

SAGE ENTERPRISES, INC. has announced PlanetAll, a World Wide Web site designed to help people build and maintain personal and professional relationships.

According to the Cambridge, Mass., firm, PlanetAll provides members with contact information for friends and business associates. Registration is free.

Sage Enterprises
(617) 621-1577
www.planetall.com

Win 3.1

CONTINUED FROM PAGE 55

Boston Edison Co. in Boston has about 2,200 seats running Windows for Workgroups 3.11, according to Wayne Lemmerhirt, manager of technical services at the utility.

About 300 users have been testing Navigator 2.0, Lemmerhirt said. But that is about to change.

"We've set a standard for going to Internet Explorer," Lemmerhirt said. "We liked the 3.0 version with the frames. It's a little closer to what Netscape is doing."

THE BOTTOM LINE

Lemmerhirt said he appreciates the added features in Internet Explorer 3.0, but he added that Boston Edison would have standardized on the 2.0 version even if 3.0 hadn't come out. "Price was really driving the decision," he said. "We like Netscape, but end users didn't want to pay for it."

The lack of immediate support for Java didn't concern Lemmerhirt. He said his company is leaning toward using ActiveX components rather than Java, and Internet Explorer 3.0 for Windows 3.1 supports ActiveX.

WE WANT JAVA

But Java support was paramount for Paul Mahowald, vice president of information systems at Blockbuster Entertainment Group in Fort Lauderdale, Fla. Mahowald wants to write all his company's applications in Java and distribute them over an intranet that is accessible from the public Internet.

"The whole idea is to let people work from home," Mahowald said. "The majority of people in their house have Windows 3.1. I can't get people to change operating systems at home."

Mahowald's situation isn't an anomaly, said Randy Hancock, an analyst at Gemini Consulting, Inc.'s C4 Lab in Cambridge, Mass.

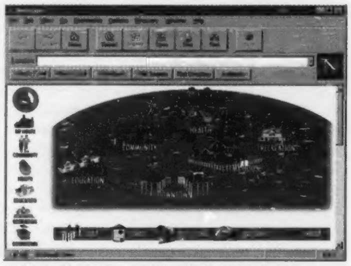
"Java is starting to make its appearance more and more," Hancock said. "There's more use of it in intranet applications where IS has more control over it. I would say [Java support in a Windows 3.1 browser] is quite important because there's still a lot of people who haven't migrated to Windows 95 or NT."

Community intranet

CONTINUED FROM PAGE 55

From the street, Celebration looks like it was designed by Norman Rockwell. It is a family-friendly throwback to an earlier and simpler era. But inside the buildings are intranet servers, and underneath the streets runs a fiber-optic backbone that carries data, voice and cable TV.

"There are 1,100 community networks today," said Amy Westwood, manager of network development for The Celebration Co., a Disney subsidiary. "None of them are doing all this and having a community come out of the ground with all the connections available on Day 1."



A Web site helps residents keep in touch

Biehler said his family moved to Celebration to escape the boredom of a tiny New Hampshire town. A former software salesman now retired with a disability, Biehler said the town's community network was also a draw. "The ability to communicate on the network with the school and the community was exciting to me," he said.

Amy Westwood: Network manager at Disney subsidiary says there are 1,100 community networks in existence

Biehler uses the intranet every day, to send electronic mail to the school, friends and local businesses. Biehler's 14-year-old son is on the intranet as well, where he has his own Web site complete with digitized movies he made at school.

Another organization watching Celebration is the New Generation Clothing Co. in La Jolla, Calif. Its store in Celebration is the first there to have a Web site, which it uses to tell residents about sales and other events.

New Generation — which is developing a larger site for the Internet, including a "virtual store" — is using the Celebration site as a pilot test for the larger site, said Greg Mickey, director of the company's support group.

"Celebration is a unique opportunity because it's an intranet, so you don't have to make the information universally applicable to all your stores," he said. "It's a way to communicate with the local community."

Celebration School has just 200 students but boasts two T1 (1.544M bit/sec.) lines connected to the Internet via the community intranet, and it will install a third one next year. By contrast, the 27 other schools that are part of the larger district that includes Celebration share one T1 line, said Scott Muri, the school's technology specialist.

How to wire a town

Celebration's fiber-optic pipes currently don't extend to homes, but empty conduit stretches to and throughout every building, allowing for future routing of fiber directly to end users.

Home users dial in to the intranet using 14.4K or 28.8K bit/sec. modems or via Integrated Services Digital Network service at 128K bit/sec.

Celebration's intranet Web server is a Silicon Graphics, Inc. Challenge DM running Netscape Communications Corp. Community System browser. Intranet users are password-protected, and the intranet itself is protected from the Internet by a firewall.

— Gary H. Anthes

Web sites can now get 'pushy'

CONTINUED FROM PAGE 55

Jose, Calif., since September.

Communications Technology Corp. in Madison, Ala., hopes to use push-oriented media to replace direct mail, according to Cheryl Sanford, marketing communications manager.

"It will enable us to distribute information at a great savings, automatically, and help us be more accountable to be sure that we are giving people what they need," Sanford said.

The best-known example of push-oriented media is PointCast, Inc.'s network, which beams news over the Internet from sources including CNN and *The New York Times*. Since autumn, more than a dozen companies have come out with push-oriented technology offerings [CW, Dec. 16], including Netscape Communications Corp. and Microsoft Corp.

Current discussions of push-oriented technology are generally framed in terms of sending information — including news, marketing, advertising or customer service details — via the Internet. Or, on an intranet, push-oriented technology involves beaming corporate information to employees.

But the potential is far greater, experts say. Marimba, in Palo Alto, Calif., is selling its Castanet product as a software distribution mechanism. A company will be able to distribute new versions of client software electronically to its own employees or corporate business partners or even to hundreds of thousands of consumers.

That will end the need for floppy-disk mailings or sending information systems staff scurrying around the country installing updates on employee desktops, said Arthur van Hoff, chief technical officer and founder of Marimba.

HELP FOR SLOWDOWNS

Push-oriented media could ameliorate bandwidth problems and server slowdowns on the Internet, van Hoff said. Users would no longer need to get an entire copy of each Web page every time they visit. Instead, their desktop software and the server would consult each other, and then the server would send down only the updated information needed.

"It's immediate access. If the information is trickling down to your desktop all the time, you don't have to wait for it," said John McCarthy, an analyst at Forrester Research, Inc. in Cambridge, Mass.

When push comes to sell

A flurry of vendors recently announced push-oriented technology. Some current offerings include the following:

- Wayfarer Communications, Inc. this month plans to introduce software called "Magnets" for pushing corporate information out to user desktops over intranets or the Internet.
- DataChannel Corp. in Bellevue, Wash., plans in January to ship Channel Manager, designed to allow intranet webmasters to beam corporate information out to employee desktops. David Pool, company founder and president, also founded Spry, Inc., which produced one of the first commercial Internet browser packages, Internet in a Box. Spry is now part of CompuServe, Inc.
- Tibco, Inc. in Palo Alto, Calif., last month announced an alliance with 12 other companies to standardize what they call "subscribe and publish" technology. Other companies include Cisco Systems, Inc., Sun Microsystems, Inc. and Informix Corp. The alliance will submit its proposal to the Internet Engineering Task Force, which sets most technology standards for the Internet. Tibco plans to release tools for building and running subscribe-and-publish applications by June.
- Lanacom, Inc. in Toronto last month unveiled HeadLiner, a news and information service that allows users to poll conventional World Wide Web sites to assemble their own information. The data can be displayed in a screen saver, ticker or in the title bar of the current application. A public beta release is available at www.headliner.com, with general availability scheduled for early 1997.
- The Internet Co. in Cambridge, Mass., last month introduced Messenger. It allows users to build their own PointCast-like networks for pushing information out to user desktops. The software is available immediately, with a $35,000 base price for intranet licensing. — Mitch Wagner

SYN-CHRONICITY

How the SYN attack works:

① Attacker computer sends a message requesting the target computer to open an Internet session.

② The target machine requests a response and leaves a channel open for up to 90 seconds.

③ In a normal Internet session, the original machine would reply at that point. Instead, the sending machine sends out more requests for Internet connections, up to 200 requests per minute.

④ Sending machine scrambles its Internet address so the signal can't be traced.

⑤ The attack takes its name from the kind of signal used – a synchronization signal.

Hack attacks

CONTINUED FROM PAGE 55

provider Web Communications LLC for nine hours Dec. 7 and for 40 hours beginning on Dec. 14.

"We probably didn't take [security] as seriously as we should have," said Web Communications President Chris Schefler. "We were guilty of assuming it would never happen to us."

The attack caused havoc among Web Communications' 2,200 business and commercial users. It followed a similar attack against another service provider, Panix, in September.

The SYN-flood attack takes advantage of a flaw in the TCP/IP protocol that underlies the Internet (see chart). The two widely known targets to this kind of attack have been Internet service providers, but any server on the Internet is at risk, no matter who is running it.

"It's the equivalent of lots of people calling you on the phone and hanging up right away," said Eugene Spafford, director of the Computer Operations, Audit and Security Technology (COAST) program at Purdue University. "You hold the phone a while going, 'Hello, hello, is anybody there, hello?' and then you hang up. But while you're holding the phone you're tying up the phone line."

Efforts to catch the hackers are frustrated by the fact that the senders use code to scramble their Internet addresses, so the session can't be traced. The attack takes its name from the kind of signal used — a synchronization signal.

The ANS subsidiary of America Online, Inc., COAST and Sun Microsystems, Inc. all have software patches designed to block the SYN attack. The latest version of Netscape Communications Corp.'s commercial Web server is more resistant to attacks than earlier versions — including the version Web Communications is using — but Web Communications officials resisted upgrading because they believed the later version to be unstable.

"We are going to try to accelerate the process of getting ourselves on a more resistant Web server," Schefler said. "We're also talking to Cisco about things to be done on the routers to shield them."

> **"If the attacks lasted for more than a few minutes each, we would find out who was doing them and we would shoot them." – Alexis Rosen, president, Panix**

Panix, meanwhile, has been resisting ongoing attempts to bring down its servers using a SYN attack. An unknown hacker has been trying to break in several times a week since September, when he succeeded in getting in and partially blocked services for 12 hours, said Alexis Rosen, president of Public Access Networks, Inc., which runs Panix. To block attacks, the company rewrote the SunOS operating-system kernel of its Sun servers.

"My kernel patches are far from the prettiest around, but they do work," Rosen said.

He added, "If the attacks lasted for more than a few minutes each, we would find out who was doing them and we would shoot them."

NEW PRODUCTS

NEWSOFT, INC. has announced a new version of Presto Personal Page Mac 2.5, a WYSIWYG World Wide Web editor with drag-and-drop capabilities.

According to the Fremont, Calif., company, users can create links by dragging and dropping files to a site.

Pricing starts at $9.95.

NewSoft, Inc.
(800) 436-4365
www.tophat.com

EOLAS TECHNOLOGIES, INC. has announced Spynergy Weblet Developer to allow nontechnical programmers to design, test and deploy interactive World Wide Web content.

According to the Chicago company, Spynergy Weblet Developer is based on Tcl scripting language and will function across platforms. Web applets that are part of the package run identically on Windows, Unix and Macintosh systems.

Pricing is $39.95.

Eolas Technologies
(312) 337-8740
www.eolas.com

WILDCAT CANYON SOFTWARE has announced Internet Music Kit, an Internet software to create and embed music onto any World Wide Web page.

According to the Berkeley, Calif., company, the product works with original and previously published Musical Instrument Digital Interface files for any Web page.

Internet Music Kit is priced at $49.

Wildcat Canyon Software
(510) 527-5155
www.wildcat.com

Corporate Strategies

Case Studies ♦ Trends ♦ Outsourcing

Briefs

Megabonus

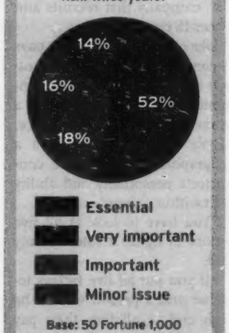
Kingston Technology Corp. in Anaheim, Calif., wowed its employees last month with bonus checks that averaged $75,000. The memory products manufacturer said it wanted to share in the bounty of the $1.5 billion sale of 80% of Kingston to Softbank Corp. in Japan last year. The owners said their company dominates the computer memory industry because of its employees. "They are the ones working hard day in, day out," co-owner John Tu said. "Our attitude toward our employees is, 'You deserve this. You deserve more than this.' "

Year 2000 services

Lexa Software Corp. in Santa Clara, Calif., has introduced a set of services to help firms determine if their systems are year 2000-compliant. The services are aimed at IBM MVS, Unix, C++ and other types of code and can be conducted remotely or on-site by Lexa. Each platform costs $19,000 for remote service. The on-site service costs $27,000 and includes travel, food and lodging for Lexa consultants.

Get to know the Internet. That's the best career advice for consultants specializing in packaged applications such as SAP's R/3 or Baan's enterprise software

How important are browser front ends to your packaged application strategy over the next three years?



Base: 50 Fortune 1,000 companies

Source: Forrester Research, Inc., Cambridge, Mass.

OUTSOURCING

TI deal aims to reduce migration risk

TI's Phil Coup

Expertise in client/server will help his firm keep up in the semiconductor industry

By Thomas Hoffman and Patrick Dryden

TO KEEP PACE with a semiconductor industry that is expected to double to $300 billion within five years, Texas Instruments, Inc. has hired Andersen Consulting to help it shift its core applications from mainframes to client/server computing.

TI's move appears straightforward. The 250 information systems staffers who support the company's $8 billion semiconductor group are predominantly mainframe-oriented and lack the skills needed to install and monitor third-party applications such as SAP AG's R/3 business software, which TI plans to use for its core financial applications.

RISK TRANSFERRED

But the Dallas-based technology vendor gains in other respects, too. Under Andersen's Design, Build, Run program, TI will be able to capitalize the expenses of the five-year, $200 million outsourcing pact when the systems are accepted into production.

That way, the risk transfers to Andersen, and production-ready systems have to be accepted by the business units "before we get a clean bill of health from a contracting point-of-view," said David Rich, a partner in the Electronics and High Tech practice at the Chicago-based consultancy.

The performance-based deal "is key to how soon we can get these systems into our business," said Phil Coup, vice president of TI's semiconductor group, which represents more than 60% of the company's $13 billion revenue stream.

Because the typical PC customer upgrades his system every six months or so, TI needed to run its semiconductor unit's financial operations on a "more

Andersen, page 60

Managers, workers play the pay rate game

▸ *Location, project length contribute to salaries*

By Julia King

ARE YOU CHARGING enough for work as a Smalltalk developer, Oracle Corp. database designer or Java programmer?

As a hiring manager, are you paying too much?

The answers could be no more than a few clicks away on one of a growing number of Internet sites that list information systems workers' hourly rates and annual salaries (see chart).

But a word to the wise: Look beyond the dollar signs. Several other factors, notably geographic location and project duration, figure squarely into an IS worker's worth, even in today's booming job market.

"You may find someone with the same skills getting $120 an hour for an eight-hour assignment vs. $60 an hour for a seven-month assignment," said Janet Ruhl, whose Real Rate Survey home page (ourworld.compuserve.com/homepages/Janet*Ruhl) lists some 500 rates charged by IS contractors on jobs in the past three years.

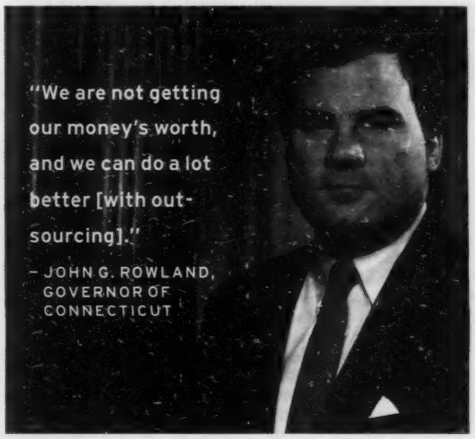
As of Dec. 12, when the sur-

Pay rates, page 60

HOW MUCH DO YOU MAKE?

See these Web sites for annual salaries and salary surveys of IS people

- www.computerworld.com/search/AT-html/features/9609/960903salary.html
- www.careermag.com/salary/salary.html
- www.ioma.com/ioma/rss
- jobsmart.org/tools/salary/index.htm
- www.npa.org/member/salary.html
- www.brint.com/jobs.htm#Salary



> "We are not getting our money's worth, and we can do a lot better [with outsourcing]."
>
> – JOHN G. ROWLAND, GOVERNOR OF CONNECTICUT

A Connecticut Yankee steps into outsourcing's court

By Thomas Hoffman

THE GOVERNOR OF Connecticut wants to outsource the state's entire information technology infrastructure as part of an effort to run the state more like a private business.

Millions of dollars in cost savings would no doubt please Connecticut's taxpayers, but state union leaders who oppose Gov. John G. Rowland's recently announced IT outsourcing plan insist that up to 700 of the state's 1,000 information systems employees will lose their jobs. Having already lost thousands of jobs in the past decade because of the consolidation of the defense and insurance industries, Connecticut can ill-afford to make any missteps.

Union leaders are concerned that state IT employees either won't receive employment guarantees from the outsourcing vendor selected or will get temporary jobs at best. Those fears

Connecticut, page 60

Course enlightens execs on SAP's R/3 software

▸ *Many unaware of how projects work before making purchases*

By Julia King

EVERY WEEK, BUSINESS managers and other high-level executives at dozens of companies sign multimillion-dollar contracts to buy SAP AG's enterprise R/3 software.

What amazes Michael Doane, director of The Consulting Alliance in Sioux Falls, S.D., is how few businesspeople fully comprehend exactly what they are getting into.

TRAINING CLASSES

"It's stunning how little executives know before making a decision to spend many millions of dollars on SAP software," he said.

For example, "most executives don't understand that SAP is not a systems project, but a business project," Doane said. "They also don't know that there's never a clear and measurable moment when implementing SAP is over. Instead, it gets implemented to a degree, then iterated and reiterated."

These are among the topics Doane and Jim O'Keefe, also a director at Consulting Alliance, cover during a unique two-day, $750 SAP training course. The course was designed specifically for business executives and information systems managers looking to educate top managers about their role in SAP implementations.

Most other SAP training classes focus on technical and end-user issues, but the executive course concentrates on how the integrated software enables a company to change the way it does business.

ESSENTIAL INFORMATION

During so-called "sandbox" exercises, managers can change a front-end business process, such as how a company receives orders, then see how that change affects subsequent processes, such as manufacturing, shipping and billing.

"The training gives businesspeople information they need to know what's even possible with SAP," O'Keefe said.

Linda Lewis, an SAP manager at Du Pont Co. in Wilmington, Del., views executive training in SAP software as essential if Du Pont is to capitalize on the system's potential benefits.

Du Pont is looking to standardize on the integrated software throughout its worldwide operations. About 2,000 users are in production on various R/3 systems at the company, and this year it will have 30 R/3 projects under way.

"SAP projects are different than any other kind of project that businesspeople have had experience with," Lewis said. With SAP, "the programming is already done. What you're doing is the configuring and figuring out how you want the business processes to run," she said.

"An [executive] course like the one we took brings other companies' experiences into the room, so businesspeople can hear what the impact is as you go through an SAP project," Lewis said.

One of the most important things executives learn during training is that they can and must make radical changes in how they do business to get the software's full benefits, Lewis said. "You learn that if it is an IS-driven project, it will not succeed," she said.

WHAT BUSINESS MANAGERS ON AN SAP PROJECT CAN EXPECT

Classical software project	SAP project
▮ Caters to individual divisions	▮ Addresses entire company
▮ Evolves incrementally	▮ Forces radical evolution
▮ Primary activity is software development	▮ Primary activity is business re-engineering
▮ Project method is step-by-step	▮ Project method is iterative and interactive
▮ IS and users negotiate design	▮ Users define usage

Source: The Consulting Alliance, Sioux Falls, S.D.

Connecticut

CONTINUED FROM PAGE 59

persist even though the governor and Rock Regan, project director at the Office of Information and Technology in Hartford, said there are no plans to lay off any IS staffers.

Observers said Rowland and his top IT officials would be well-served to look at the state of Indiana to see the backlash an outsourcing plan can have.

Last year, Indiana tried to become the first state to outsource all its IS functions after witnessing the success that the city of Indianapolis had with outsourcing. The city's seven-year, $11.7 million per year contract with Systems & Computer Technology Corp. (SCT) guaranteed employment for former government employees at SCT for six months at equal or greater pay.

But Indiana state labor officials complained that the outsourcing would result in widespread unemployment. More negative publicity was generated when a local newspaper profiled a diabetic mother whose job as a state data center operator was tenuous, threatening to leave her and her children on welfare.

Indiana "failed to anticipate the job and political ramifications and negative publicity that outsourcing can generate," said Meghan Cotter, an analyst at G2 Research, Inc.'s state and local government IT outsourcing group in Mountain View, Calif.

Connecticut, meanwhile, spends roughly $300 million per year on IS. Most of the systems are archaic and fail to form connections among the state's 60 highly fragmented agencies.

For example, the Department of Social Services, which helps get people jobs, and the Department of Welfare, which assists many of the same people, don't share any data, Regan said.

"We estimate that we've spent $2 billion [on IT] since 1990, and we don't feel we've gotten payback," said Regan, a boyhood pal of Rowland's who joined the state in 1995 after a 12-year stint as an IT project manager at Sikorsky Aircraft in Stratford, Conn.

COST SAVINGS

Regan, whom sources expect the governor to name as the state's chief information officer this month, said he wasn't sure how much money the state stands to save until it sends out requests for proposals this month and receives responses back by early spring. An award is expected by July.

One of Connecticut's biggest IT problems, Regan said, is that it has two separate agencies that oversee IT issues: the Bureau of Technical Services and the Office of Information and Technology. That may explain why no one seems to know how many PCs the state owns.

The state also lacks ample LAN and server disaster recovery plans, doesn't know in detail what IS skills are on staff and doesn't have a centralized security system to protect confidential information, according to a study by KPMG Peat Marwick.

Perhaps Connecticut will fare better than Indiana. State officials such as Rowland and Regan are sensitive to the political ramifications of their outsourcing proposal, said George Logemann, an analyst at The Yankee Group in Boston.

Andersen

CONTINUED FROM PAGE 59

flexible" client/server architecture to help it react more quickly to changes in the fast-paced industry, Coup said.

For example, it used to take TI up to nine months to code a mainframe program to support a new business entity, he said. Under a client/server architecture, applications can be generated within a few weeks.

Andersen's value-based pricing model "is putting them on the map" for longer outsourcing deals that otherwise would have gone to outsourcing kingpins such as Electronic Data Systems Corp., IBM or Computer Sciences Corp., said Allie Young, a senior analyst at Dataquest Worldwide Services Group in Westboro, Mass.

Coup declined to quantify TI's expected cost savings.

Andersen, which officially began the work last week, will develop some unspecified applications itself and install SAP R/3 Version 4.0 to support TI's financial systems. TI will retain a handful of mainframe systems, such as its tax systems, for regulatory purposes.

Pay rates

CONTINUED FROM PAGE 59

vey was last updated, hourly rates for Microsoft Corp. Visual Basic skills ranged from $30 for a programmer on a 10-month assignment in Denver to $80 for a programmer working on random assignments in Philadelphia.

"Also, if you live in Silicon Valley or New York City, you're going to get a lot more no matter what you're doing," Ruhl said.

Recruiters said workers who know the newest, hottest technologies, such as Sun Microsystems, Inc.'s Java programming language, also tend to command higher hourly rates — even though they are frequently the IS workers with the least amount of on-the-job experience.

"Extraordinary rates are being paid to people without a lot of experience. The problem facing hiring managers is establishing how good these people really are," said Gary LaFave, president of Winter, Wyman Contract Services, Inc., an IS recruiting firm in Waltham, Mass.

"There's also a real danger of people thinking they're worth a lot more than they really are," said Ray Marcy, CEO of Interim Services, Inc., a Fort Lauderdale, Fla., company that recruits and places IS contractors.

Like other firms, Interim pays IS contractors based on the location and duration of an assignment. But it also factors in a worker's years of experience, supply and demand within a geographic market and a contractor's personality and ability to fit within a client's culture.

"You have to look at all five factors to figure a rate," Marcy said.

"If you put all five factors together and a person was at the high end in all five, their pay rate could be as much as 40% to 50% higher than if all five points were on low end," he said.

Tough spot for guys
Men in IS find that the office can be a hard place to be politically correct, Laura DiDio writes in Ms. MIS, page 66.

Managing

THE NEXT GENERATION

Today's 20-something users think they know as much as you do about technology. Sometimes they're right. How do you manage that sometimes lethal combination of expertise and chutzpah?

Cigna Reinsurance's Bud Baumann (top) doesn't ignore the computer knowledge of 20-somethings such as Lynn Belcher and Mike Johnson.

PETER SERLING

CONTINUED FROM PAGE 3

business performance and services.

"These are the guys you see climbing poles and digging ditches. Yet they know how to surf the Internet, and they're perfectly comfortable working with handheld computers," he says.

In case you haven't noticed, there are some new folks on the corporate block, and they're providing information systems with some formidable challenges.

We aren't talking about occasional power users who take an interest in technology above and beyond their paid jobs as accountants or sales representatives. No, this is a whole generation of users who cut their baby teeth on 286 chips and learned their RAMs and ROMs before their ABCs.

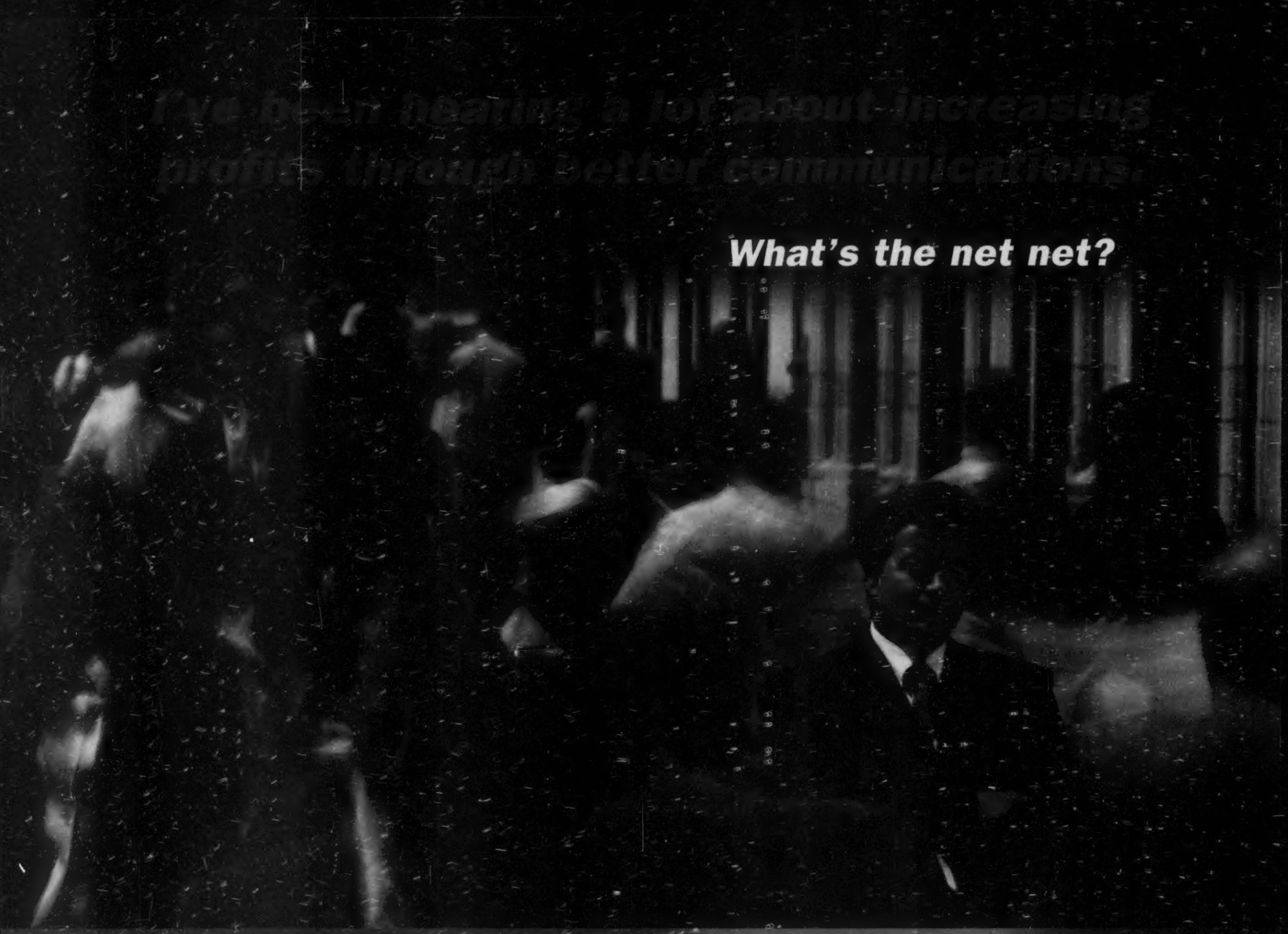
They'll seize more of your support time. They'll gobble up your training budget. They'll also make your best technologists very nervous. Not only because it can be hard to keep ahead of them, technically speaking, but also because their confidence — some might say chutzpah — in technical matters can create havoc on the corporate network.

Still, IS managers say the knowledge and enthusiasm of these Young Turks can be harnessed to excellent effect.

ENLIST THEM AS STANDARD BEARERS

Lew Temares, chief information officer at the University of Miami in Coral Gables, Fla., echoes the words of many information technology managers when he says, "A little knowledge is a dangerous thing." Although certainly computer literate, users of the new generation tend not to know too much about networks,

The Next Generation, page 63


I've been hearing a lot about increasing profits through better communications.
What's the net net?

THE NEXT GENERATION

CONTINUED FROM PAGE 61

specifically about the *enterprise* approach to managing computers. "They tend not to realize that what you do to one machine will affect everyone," Temares says.

The only solution, he says: education.

"We make a point to explain both the economic and the opportunity costs of having something go wrong because they deviate from our standards," he says.

Temares makes a point with Hurricane Andrew, which devastated the campus in 1992. After the storm, Temares' staff began getting calls from frantic departments that had built systems without help from the central IS staff. Because they didn't establish basic data backup and disaster-recovery procedures, "there were some departments that suffered significant losses," says Temares, who adds that "explaining the very high potential costs goes a long way toward convincing users to stay with the program."

Baumann has tapped the enthusiasm of the new generation by making its members early users of a new desktop architecture Cigna is rolling out. Previously, Cigna had standardized on WordPerfect, Lotus 1-2-3 and OS/2 on the server running Windows. Now, it's moving toward Windows 95 on the desktop, Windows NT on the server and Microsoft Office. The change will be difficult for old-timers, he says. But by placing the new configuration with youthful enthusiasts first — and encouraging them to act as evangelists — Baumann says, "they'll help enormously with this major transformation."

MARK ALCAREZ

Still, there's probably only so much you can do. Mark Factor, vice president of IS at Au Bon Pain Co., a Boston-based chain of coffee shops, points out that "these new users tend to be explorers. They want to see what's behind every button. You might think you have standard network PCs out there. But when everyone knows how to get into setup programs, anything can happen."

INVEST IN TRAINING FOR YOUR STAFF

One of the biggest challenges CIOs say they face is that already overstressed IT staffs are being pushed to the limit. They're shouldering an ever-heavier support burden as PC use rises and networks proliferate. And users themselves are rapidly approaching professional levels of technical experience.

"It's a struggle for us to stay ahead of the pack," Factor says.

There's only one answer: Don't skimp on IT training. But finding the time — and money — to do that can be difficult.

Marc Fournier, chief of informatic services at Canada's National Museum of Science and Technology in Ottawa, has two PC software experts to support more than 180 employees. And training those two employees is very expensive. For example, a WordPerfect course for an end user costs just $176. A Windows NT class for an IT staffer? More than $2,000. "Management looks at these numbers and often concludes we can get more value by training the users," he says.

PATIENCE, PATIENCE

Above all, expect that these savvy users will require more of your time. Sure, they keep up on the latest technological developments. But that means they have definite opinions, know enough to ask difficult questions and are less likely to be satisfied with easy answers.

"You really have to slow them down," Baumann says. His younger users are particularly eager to get the latest software releases. "They read the articles, they understand exactly what has been tweaked, what the performance advantages are," he says. The older generation usually dreads having to relinquish a familiar software package no matter what improvements are promised.

> These new users "tend to be explorers. They want to see what's behind every button."
> – Mark Factor, Au Bon Pain

The solution? The thing you don't do is brush off these types of inquiries or patronize the questioner in any way. LaRossa always takes great pains to respond with respect for users' intelligence. "I explain that our computing devices, since they are attached to the network, must fit certain specifications," he says. "I explain about data formats, how it takes time to convert our existing databases to the new standard."

The danger of not responding the right way is that you run the risk of alienating these very smart users. "The last thing you want is for them to go off on their own because they're not satisfied with your explanation," Baumann says.

Temares takes advantage of the cries for help that ensue when an overconfident user gets into trouble. "It's a great time to be helpful. You won't find a better way to win over a user than to show up at 9 p.m. after they've crashed the departmental server." Once you've got a dialogue going, you can begin wooing them back to the standards fold, he says.

LaPlante is a freelance writer in Woodside, Calif.

MANAGING YOUNG TURKS

DO implement centrally controlled standards for any computing device that connects to the corporate network.

DO provide succinct but thorough reasons for these standards to new employees — preferably when handing over initial hardware, passwords and network access.

DO explain the possible ramifications if standards are violated. For example, prepare a report on the financial ramifications of a network crash, lost data and so on. Some IT managers even warn that problems arising from nonstandard hardware or software are the responsibility of the user and the user's departmental budget.

DON'T approach rules in a confrontational or antagonistic way. Building relationships is the only way to manage sophisticated users.

DON'T assume your IS staff knows more than the end user about a particular technology — especially one the user is immersed in daily.

DO invite users to participate in advanced training or IS seminars as appropriate.

DO encourage users to be involved in departmental installations or decisions.

DO encourage expert users to help their colleagues or volunteer for "train-the-trainer" type roles.

DON'T "punish" users who go off on their own. That will only result in a downward cycle of one-upmanship.

DO explore alternative training methods that will better fit individuals' needs and schedules.

DON'T discourage or mock users who come bearing clippings from magazines or newspapers and asking questions about IT products or decisions. Take the time to educate them on reasons for doing things the way you do.

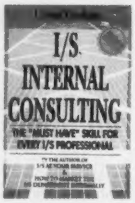
RESOURCES: IS MANAGER'S BOOKSHELF

I/S Internal Consulting: The "Must Have" Skill for Every I/S Professional (second edition)

By L. Paul Ouellette
Kendall/Hunt Publishing Co., Dubuque, Iowa; 151 pages; $29.95 (hardcover)

For many information systems professionals, being a technical expert is no longer enough. That's because today's business managers demand to know how information technology helps the business and are likely to outsource IT functions that don't provide strategic bang for the buck.

One way for IS to combat the threat is to become an "internal consultant," understanding users' business needs so well that IS becomes a key partner instead of a backroom cost center. In this book, Ouellette aims to tell IS professionals how to make that leap.



The book gets off to a slow start, with wordy explanations of why IS professionals need to act like consultants and the different ways IS professionals can interact with users. But the pace picks up in the second half, as Ouellette offers concrete tips about how to handle each stage of a consulting engagement.

Ouellette provides detailed advice about everything from running information-gathering meetings to what to do if a prospective client starts telling you about his divorce. (Answer: Try to change the subject. If you can't, politely end the meeting. Knowing intimate details about the client won't help you and could hurt you.)

Ouellette also offers advice on how to handle chatterbox clients, conduct negotiations and handle conflict. Although many of his suggestions could also be found in other books on negotiation or conflict management, Ouellette does a good job tying them together in a form IS managers can understand and use.

— *Robert L. Scheier*

The 7 Keys to Effective Web Sites

By David Sachs and Henry Stair
Prentice Hall, Upper Saddle River, N.J.; 352 pages; $26.95 (paperback)

The top brass is catching World Wide Web fever, and there's been some rumbling about developing a Web site. The job may fall to you.

If you're looking for ideas on how to make that page sing, you may find this book valuable. Sachs and Stairs detail what makes a Web site cool and offer a few examples. They also point out what they see as flaws on some pages, but they don't just take potshots; they offer remedies.

Sachs and Stair have a couple of recurring pet peeves. They frown on visitor registration at free sites, saying people find the practice annoying. Another gripe: Site spots that look like hyperlinks but aren't. Their advice: "If it looks like a hyperlink, make it a hyperlink."

One criticism: The authors tout some sites' visual appeal, but their examples are printed in black and white. Some are reprinted in color in an appendix, but it would have been worth paying the printer extra to run each example in color and ditch the appendix.

— *Rick Saia*

LEILANI ALLEN

WHEN A CAREER DREAM BECOMES A NIGHTMARE

What do you do when faced with a senior technician who wants to become a manager yet has zero people skills? What if that desire turns into desperation?

Rory was a 42-year-old senior systems programmer. He had been with the company eight years and had steadily progressed up the ranks. He was the kind of guy who'd take the latest technical bulletin to the cafeteria and consume it along with his cheeseburger and fries. He often used his knowledge to intimidate his peers. He preferred to work with headphones on, proclaiming that the noise drowned out "mindless office chit-chat." He frequently worked late, looking for ways to make the system more efficient.

Each performance evaluation lauded his technical skills, his initiative in learning new technologies and his problem-solving abilities. On the other side, his evaluations said his interpersonal skills were severely lacking. He was abrupt with peers, condescending to subordinates and made little effort to conceal his contempt for management. Yet Rory very much wanted to be a manager because he felt he was as good as anyone in that position and because he felt he was owed the perks and recognition the job would bring.

Management, wanting to retain an invaluable technical resource, had tried giving him some project leader assignments. To put it mildly, that wasn't successful. In the last of those assignments, Rory was named project leader, supervising three others. He was also required to interface with a development team and an external vendor. Rory's idea of supervision was to create enormously detailed task lists. He would stay late every evening to review subordinates' work and send lengthy E-mail messages suggesting improvements. He blamed any flaw on the vendor and loudly criticized the development team for its inadequacies. Complaints flooded in.

As years went by, the dialogue at reviews became more hostile, with Rory completely unable to understand that a manager had to communicate, encourage, motivate and support others. He became bitter and depressed and withdrew into himself even more. He was increasingly irascible, and people avoided him if possible. His manager, concerned about Rory's attitude, considered suggesting counseling but feared the reaction.

At his last performance review, Rory once again failed to earn a promotion. Rather than blowing up, Rory sat in silence. His manager had never seen him so depressed and once again considered broaching the subject of counseling. But he said nothing. That weekend, Rory committed suicide.

Judgment call: Rory's manager had done everything normally required of a supervisor: set clear standards, fairly evaluate performance, give the employee the opportunity to succeed in the desired position, provide honest feedback. Yet she was at a loss about how to deal with the emotional side of management — how people feel about themselves and others. She might have more forcefully intervened, strongly suggesting counseling. Perhaps it wouldn't have made a difference, but she might have slept better afterward knowing she'd tried.

Organizations can provide alternatives for highly skilled technicians such as Rory. A dual career path can turn senior programmers or analysts into engineers, architects or internal consultants. They can thus have the earnings and prestige of managers without the requirement to manage staff.

Another concept is to have a senior staff member become an "acting manager" for a defined period of time — say, six to 12 months. He performs most managerial functions but is given special coaching by a senior manager. Feedback is solicited from peers, staff and clients. If it works out, he gets the promotion. If not, he has retained his old title and can resume his former role.

Allen's column deals with the kinds of people issues managers face every day but are reluctant to discuss openly. Each column is based on a real-life situation. The names and certain circumstances are changed to protect confidentiality. Allen, a director at Tenex, a management consulting firm in Burlington, Mass., invites readers to share experiences with her via E-mail at lallen@tenex.com.

END TAXATION

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MS.MIS
WOMEN IN INFORMATION SYSTEMS

THIS ONE'S FOR THE GUYS

BY LAURA DIDIO

Male IS professionals and their female managers are having a tricky time navigating the treacherous waters of political correctness

Since I started writing this column nine months ago, nearly half the letters I've received are from male IS managers and corporate executives.

They're serious, thoughtful, humorous, disbelieving, questioning and incredulous. Although the opinions and experiences are wildly divergent, the letters have a singular theme: how men deal or don't deal with women professionally.

In this age of feminism and shattered glass ceilings, our high-tech male counterparts are having a tricky time navigating the treacherous waters of political correctness. The results are wide-ranging: denial, hilarity, fear, common sense.

Let's deal with the denial. Several men tell me they don't believe gender bias exists in the workplace because they've never seen it. That's the whole point, guys: It isn't supposed to knock you over the way Holyfield did Tyson. In fairness, most of the men who express this viewpoint are reasonable and egalitarian — though not necessarily eagle-eyed.

Many organizations, especially large businesses, have strict rules and require that their employees take sexual harassment and sensitivity training classes. And they move fast to address even perceived instances of gender bias. That's been the case at Atlanta-based Kaiser Foundation Health Plan. Kaiser, by the way, employs mostly women — except in the IS department, which Gary Wilkerson, program administrator, describes as one of the few male bastions in the 90,000-person company. Wilkerson reports that because there are so many women and highly placed female executives, the men "are pretty well sensitized" and just deal with them naturally.

COMPUTERWORLD

This week on our Web site, @Computerworld, DiDio will facilitate a discussion about male IS professionals and gender bias. (www.computerworld.com)

After some prodding, Wilkerson acknowledged that, yes, there have been cases of gender bias in hiring — in favor of female IS applicants. We'll pause to let the women cheer and the men to say, "Told you so." Back to Wilkerson: "For a while, whenever we filled a new IS position, we would joke, 'What's her name?'" Happily, Kaiser proved as fair for its male employees as it was for the women. After the men complained, the company instituted counseling, and "the situation resolved itself," Wilkerson says.

Not all men have been as lucky.

One IS manager, who considers himself unbiased and is interested only in whether his network administrators and software engineers — male or female — can do the job, found himself the subject of a sexual harassment complaint. The allegation stemmed from a training session in which the IS manager, who requested anonymity, says he was training a female software engineer. While she sat at her workstation, he stood behind her and put his hand on her shoulder. Period. "When I was called down to human resources and told about my 'inappropriate' behavior, I was stunned," he says. Now, he says, "I keep my distance — literally. I stand three feet away with my hands in my pockets."

ON THE WRONG TRACK

Then there's the "daddy track." Although it's routine for businesses to offer maternity leave, paternity leave has been slower to catch on. A network administrator at a midsize organization says that when he applied for paternity leave at his Texas-based company, men and women laughed at him. "There was lots of talk about 'real men,' and someone suggested I move to Sweden," he says. Did he take the leave? "You bet I did, and I used the nine weeks to look for another job."

Still another hapless fellow found himself one of only two males in a small, privately held woman-owned business. The women, he says, were anti-male. "If you weren't Harvey Milquetoast, watch out," he says. Everywhere he turned, he says, there was some form of militant male-bashing, including explicit messages tacked to a refrigerator. This man, who says he'd never think of treating a woman the way the women treated him, left in short order.

These tales unfortunately prove that women can be just as guilty of discrimination as men. Discrimination, regardless of whether it's reactionary, is still discrimination.

In answer to the question posed nearly a century ago by Sigmund Freud — "What does a woman want?" — in the workplace at least, we want the same opportunities, salaries and treatment that our male counterparts get. And we want those things served up with a healthy dose of respect. We'll do the same, thank you.

Laura DiDio is Computerworld*'s senior editor, LANs.*

Buyer's Guide

BUYER'S ADVISORY

It's 9 a.m. on the first Monday in January, and the year 2000 countdown is under way

BY AMY MALLOY

BEAT THE CLOCK!

Imagine you work at a Fortune 500 company that has more than 100 million lines of code. Eliminating the year 2000 problem from just 100,000 lines of that code will take one programmer a full year. Now imagine how much work will go into cleaning up the 100 million lines of code, and you see why year 2000 project teams must prioritize their efforts so that at least the most important applications are fixed before the calendar strikes 2000.

Companies that don't move now to erase the year 2000 traps in their most important applications may face bankruptcy, lawsuits or go out of business, says Bruce Hall, research director at Gartner Group, Inc. in Stamford, Conn.

This isn't a scare tactic. Hall estimates that half of all organizations won't finish on time, and 30% of mission-critical applications won't be ready on time.

So choosing tools to battle year 2000 problems requires thought and consideration. To help companies make these mission-critical decisions, *Computerworld* looked into four key categories of tools: analysis, conversion, testing and integration. The vendors and tools listed within each category are examples cited by the various analysts interviewed. There are more than 40 vendors in this market, and new players continue to appear.

Computerworld consulted four experts to get advice on buying tools to prepare for 2000. In addition to Hall, we spoke with Leland Freeman, managing director of year 2000 services at Management Support Technology, a consultancy in Framingham, Mass.; Mike Egan, program director at Meta Group, Inc. in Burlingame, Calif.; and Dick Heiman, research manager for application development tools at International Data Corp. (IDC) in Framingham.

In addition to the products cited, companies may also consider outsourcing, which many vendors provide. But the analysts caution that even outsourcing isn't necessarily painless. There's no way to simply dump the problem into a service provider's lap and wait for a pain-free resolution; company involvement is unavoidable. "You just can't off-load the entire problem," Heiman says.

But if a company decides to go with a service provider for part or all of the process, it must act quickly. "The issue is going to be supply," Hall says. The supply of available help is dwindling fast.

Beat the clock, page 68

ANALYSIS TOOLS

The first step in a year 2000 project is determining the severity and pervasiveness of the problem. Once this information is in hand, a manager gains a sense of how much the project will cost and how long it will take to complete.

Analysis tools, which search out the affected applications, assist companies with this initial phase. "The purpose of an analysis tool is to present that information and provide an impact report to generate an impact assessment," Freeman says. "The major objective of this phase is to understand the size and scope of the problem."

Within this stage, managers should prioritize their efforts. It's important to determine which programs will break first, the complexity of the programs and which programs will be easiest to fix, Freeman says.

When reviewing these tools for purchase, a company should look for "tools that will identify date usage, trace date and data flow through an application and present that information in some way, either a report or a graphical format," Hall says. "Ideally, you want it to identify for you where your problems are, where the issues are."

Heiman categorizes analysis tools into two major groups. The first group consists of basic engine code analysis tools that have built-in extensions to look for date-related fields. The other class includes niche players, companies that specifically address the year 2000 problem. These tools have specialized fields to do date calculations, he says.

The analysts unanimously agree that Platinum Technology, Inc. is a good example of a vendor that has a solid analysis tool. The vendor markets and sells SystemVision 2000, a tool developed by Adpac Corp.

Another recommended tool is Isogon Corp.'s TicToc. It "basically goes out and assesses the number of lines of code and where you have date fields," Egan explains. The end result is an estimate of the number of date occurrences and how much it would cost to fix them.

Here's a sample listing of analysis tools to address the year 2000 issue:

TicToc
Isogon Corp.
New York
(212) 376-3200
www.isogon.com

Giles
Global Software, Inc.
Duxbury, Mass.
(617) 934-0949
www.globsoft.com

VIA/Alliance,
Estimate 2000,
VIA/Recap,
VIA/Insight,
VIA/SmartEdit,
VIA/SmartTest (extensions
on existing tools)
Viasoft, Inc.
Phoenix
(602) 840-4068
www.viasoft.com

SystemVision Year 2000
Platinum Technology, Inc.
Oak Brook, Ill.
(630) 620-5000
www.platinum.com

Revolve/2000
Micro Focus, Inc.
Palo Alto, Calif.
(415) 856-4161
www.microfocus.com

HourGlass 2000
Mainware, Inc.
Maple Plain, Minn.
(612) 932-9154
www.mainware.com

CONVERSION TOOLS

Once a company finishes analyzing the problem, it must decide whether to fix the affected systems, consolidate them in an attempt to minimize the year 2000 problem or replace those systems with year 2000-compliant systems, Freeman says.

If a company decides to keep or consolidate the existing systems, the next step is to implement the most essential changes. This is where conversion tools help.

"The first major consideration is the degree of automation [a particular tool offers]," Freeman says. As time runs out, "you won't find enough people to address the problem," so automation is an important consideration.

Freeman also recommends looking at throughput, or how quickly the tool performs the changes, as an additional time-saver.

Another important question to ask is whether the conversion tool interfaces with the analysis tool. If not, the work performed during analysis is less effective. "Typically, you want to leverage the two steps" by having the analysis tool feed its findings directly to the conversion tool, Hall says. He does say that "you can get a lot of value from an analysis tool and go in and change the information."

Conversion tools come in the form of scanners, parsers and conversion systems. There are also multilanguage generators for companies that have a lot of obscure code, Egan says.

One conversion tool vendor is Peritus Software Services, Inc., which claims its product can fix a million lines of code in a weekend. But the hit rate is 80%, which means a company has to find which lines of code the tool missed, and then programmers must manually plug in new structures, Egan explains. But this is still a quick way to find all of the affected code, he says.

Egan also recommends looking at Viasoft, Inc. or Compuware Corp. "Compuware has been the leader in applications for testing, editing and debugging. It is the same thing for the year 2000. In that regard, they have the best reputation. Viasoft has a nice lineup of year 2000 tools," he says.

Here's a list of exemplary conversion tools mentioned by a few of the analysts interviewed:

AutoEnhancer/2000
Peritus Software
Services, Inc.
Billerica, Mass.
(508) 670-0800
www.peritus.com

VIA/Alliance,
VIA/Valid Date, VIA/Insight,
VIA/SmartEdit,
VIA/SmartTest,
VIA/SmartTest-TCA,
VIA/SmartDoc,
VIA/Renaissance
Viasoft, Inc.
Phoenix
(602) 840-4068
www.viasoft.com

TransCentury Date Logic
Generator, TransCentury
Calendar Routines
Platinum Technology, Inc.
Oak Brook, Ill.
(630) 620-5000
www.platinum.com

CA-Realia II Workbench,
CA-Visual Realia, CA-Verify,
CA-Librarian, CA-Panvalet,
CA-Endevor, CA-PanAPT,
CA-Datamacs/II,
CA-Migrate/Cobol,
CA-Optimizer/II
Computer Associates
International, Inc.
Islandia, N.Y.
(516) 342-5224
www.cai.com

Xpediter+, Xpediter/
Xchange, File-Aid,
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TESTING TOOLS

Most analysts say testing will consume 30% to 50% of the project's resources in terms of money and time, but this is an area in which tools are lacking. "This is one of the weak spots; there isn't a lot out there," Egan says.

"Testing is the black hole of this project," Freeman says. He recommends companies keep watch for new products coming into the market.

Analysts predict testing tools will be a big growth area. "I think you will see a lot of new players in the next six to nine months," Hall says. He notes that most companies aren't at this stage in the process yet. "There is not a lot of demand yet," he says.

Freeman agrees and predicts that new testing products will appear to "address a specific need, a niche area."

But there are some strong products out there right now, and all four analysts recommend looking at Compuware. "The clear leader is Compuware," Hall says.

Heiman echoes Hall's thought but also recommends looking at testing tools already in use in mainframes. "If [a company] has no way to test, [it] has bigger problems than the year 2000," he says.

When looking at testing tools, Freeman suggests looking at what level of testing the tool provides. "Is it for unit testing, stress testing or regression testing?" he asks.

INTEGRATION TOOLS

Once a company finishes testing, it must integrate the revised systems with the existing systems. This last major stage is complicated. A company has two versions of the system: a production version and a year 2000 version. The challenge is integrating the year 2000 changes with the routine maintenance changes that every company makes and bringing both sets of changes online. "One of the considerations is how do you communicate between the old and the new; it requires bridges," Freeman says.

Freeman recommends looking at "tools that will help version management and version control. That means the ability to keep multiple versions of an application properly managed. Audit trails ability and documentation features are important considerations in this category."

Heiman also mentions the need for a version management tool. "One tool that stands out is Endevor from CA," he says.

Additional traits to look for are change-tracking and approvals, Hall says.

Here are some vendors that offer testing tools:

**Xpediter+, QADirector,
QA Hiperstation
Compuware Corp.
Farmington Hills, Mich.
(810) 737-7300
www.compuware.com**

**CA-Verify,
CA-Datamacs/II,
CA-InterTest,
CA-InterTest/Batch
Computer Associates
International, Inc.
Islandia, N.Y.
(516) 342-5224
www.cai.com**

**The Relational Tools
Princeton Softech, Inc.
Princeton, N.J.
(609) 497-0205
www.princetonsoftech.com**

**Timetrap
MiraSoft, Inc.
Boston
(617) 825-9121
www.mirasoft.com**

Here are a few well-known integration tools:

**CA-Endevor
Computer Associates
International, Inc.
Islandia, N.Y.
(516) 342-5224
www.cai.com**

**Version Merger
Princeton Softech, Inc.
Princeton, N.J.
(609) 497-0205
www.princetonsoftech.com**

**PCVS Version Manager
Intersolv, Inc.
Rockville, Md.
(301) 838-5000
www.intersolv.com**

RESOURCES AND ADVICE

www.year2000.com
www.itaa.com
The Year 2000 Resource Book, Leland G. Freeman, Management Support Technology, Framingham, Mass.

Here are some general bits of advice:

►There are no elixirs. Some vendors claim to offer an end-to-end, one-stop solution, but analysts agree that there really is no such thing. "I don't believe a silver bullet will come along," Freeman says.

►Turn to whom you know first. If your company deals with a lot of old legacy applications in Cobol, it makes sense to get in touch with vendors you already use, says Dick Heiman, research manager for application development tools at IDC..

"I would pick up the phone and talk to my account rep," he says.

►Consider using new vendors. In most cases, a company wouldn't evaluate a vendor that didn't have a proven track record, but that may not be the right approach for year 2000 jobs. "In doing that, some of the best technology would be eliminated for consideration," Freeman says.

►Get support from upper management. "Make sure there is senior sponsorship in place before leaping to a tools decision," says Bruce Hall, research director at Gartner Group.

►An overall bit of advice to carry with you while making this decision is "how good of a maintenance vendor is a company. The year 2000 happens to be a large maintenance problem," Hall says.

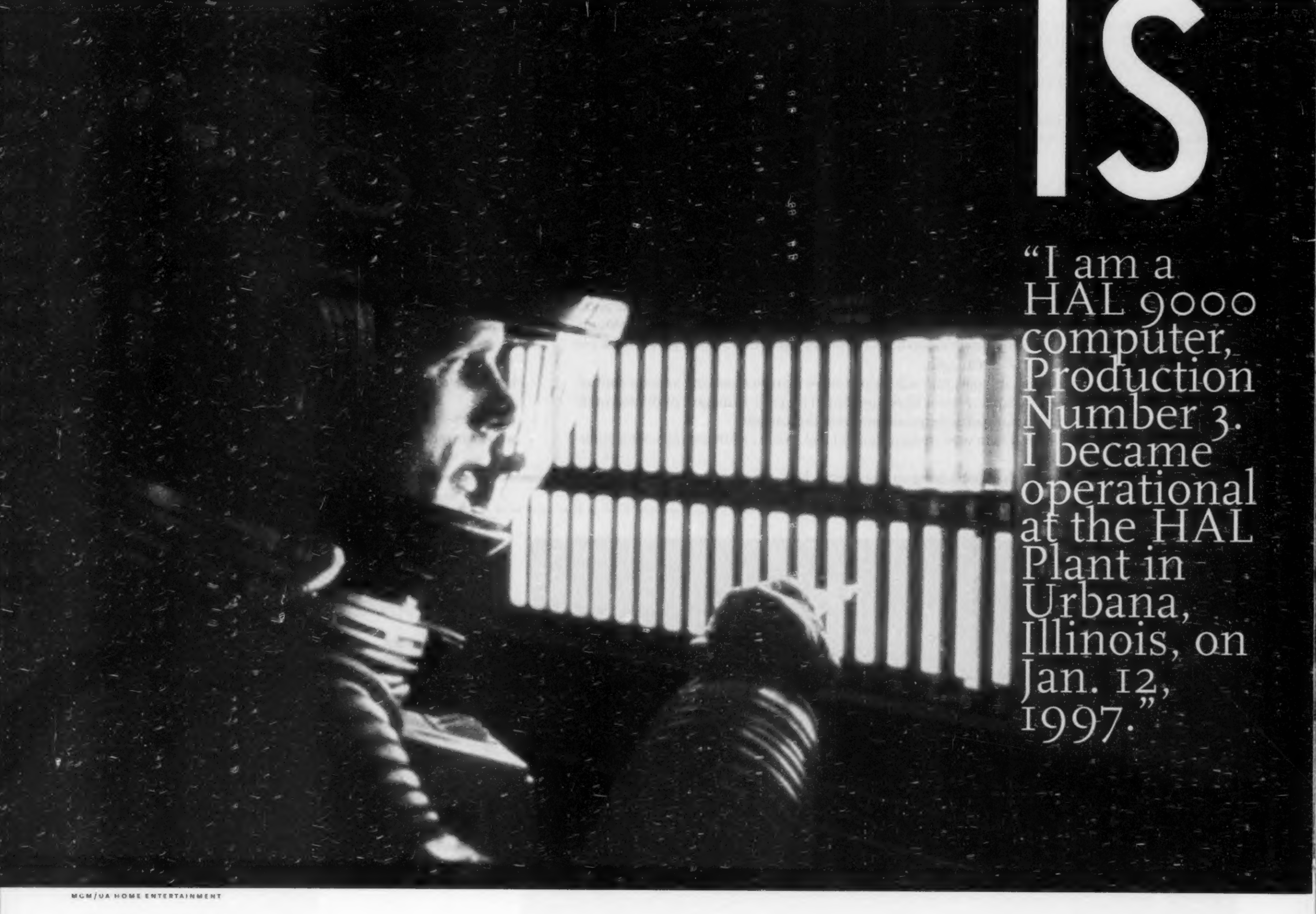
►Analysts agree that there are plenty of good tools out there, but without a comprehensive, organized approach, companies won't work through the year 2000 problem successfully. "This project absolutely has to be done with good project management techniques," Freeman says. "This is an area where I think more tools will appear."

The following analysts provided advice on buying tools to prepare for 2000 (pictured top to bottom): Dick Heiman, research manager for application development tools at IDC in Framingham, Mass.; Mike Egan, program director at Meta Group in Burlingame, Calif.; Bruce Hall, research director at Gartner Group in Stamford, Conn.; Leland Freeman, managing director of year 2000 services at Management Support Technology in Framingham, Mass. (no photo)

END NOTE

In the coming months, *Computerworld* will offer case studies of companies using some of these tools to solve year 2000 problems. If you're interested in participating, please E-mail *Computerworld* writer Amy Malloy at amy_malloy@cw.com.

HAL IS



“I am a HAL 9000 computer, Production Number 3. I became operational at the HAL Plant in Urbana, Illinois, on Jan. 12, 1997.”

MGM/UA HOME ENTERTAINMENT

> “We have thousands of expert systems that model professionals. But we have very little that can compete with a 4-year-old child on the common-sense things.” - MARVIN MINSKY

BORN

CONTINUED FROM PAGE 1

Now that date is almost here. And HAL has become embedded in pop consciousness as a symbol of the promise and threat of computer technology. A loyal — even friendly and gentle — servant becomes a malevolent killer simply because of an error in programming.

But how believable is the central premise of the story: that a machine can think with the creative intelligence of a human being? In some ways, now that computers have become omnipresent and we see their limitations and essential dumbness, the vision seems further away than ever. But many believe that an artificial intelligence is inevitable. Will it happen?

Four experts said yes.

Marvin Minsky founded the MIT Artificial Intelligence Laboratory nearly 40 years ago and is now a professor at MIT's Media Laboratory in Cambridge, Mass.

Nicholas Negroponte heads up MIT's Media Laboratory, and his thinking about human-machine interaction is capsulized in his best-selling book, *Being Digital.*

Nathan Myhrvold is chief technology officer at Microsoft Corp. in Redmond, Wash.

James P. Hogan had a long career in the computer industry, including as a senior sales training consultant at Digital Equipment Corp. In 1979, he became a full-time fiction writer. His novels, including *Code of the Lifemaker* and *Realtime Interrupt*, often examine artificial intelligence in a science-fiction context.

We spoke to each separately and compiled a virtual roundtable from the interviews.

CW: How close are we to building a computer like HAL 9000?

MYHRVOLD: In terms of the functionality of running the space ship — waking people, keeping the thrusters going, collecting data, that kind of stuff — computers can absolutely do it today.

You really need the personality aspects for the dramatic element of the movie, but it's not fundamental to what HAL did. Actually, the computers we have today wouldn't lock Dave out of the ship and kill the other guy. Or go schizophrenic.

We don't have a manned ship to Jupiter. That's sort of a little detail.

HOGAN: We have hard, tangible evidence that intelligent thinking systems exist, in the form of 5 billion human beings. They are physical, electrochemical systems, and they think, they are intelligent. Is there any reason to propose that a system of comparable complexity that happens to come from different origins — to have been man-made in some way — shouldn't be capable of doing likewise? Absolutely no reason to think that at all.

But I'll be surprised if it happens in the next 50 years.

MINSKY: We have many thousands of expert systems that model professionals. But we have very little that can compete with a 4-year-old child on the common-sense things that everyone knows how to do. Maybe the most notable ones are in the sensory area — being able to look around a room and see what's there. Or being able to listen to a situation and hear what's there.

The other thing is common-sense knowledge. Just knowing that things fall if you put them down unsupported. My favorite example is that you can pull things with a string, but you can't push them.

MYHRVOLD: We're still not in the domain where the computer exhibits general-purpose reasoning. In a specific domain like how to take an airliner and make it land, because that domain has been reduced to very specific feedback and control systems and software, [computers] can do that.

Speech recognition is very hard. We don't understand each other very well. One of the ways we understand each other is that we'll wait until the end of a sentence and then realize what was meant. If I start to say something and you don't understand, you'll look puzzled, and I might stop and reiterate.

Part of it has to do with genuine ambiguity. For instance, “how to wreck the nice beach” — part of the seashore — and “how to recognize speech.” If you say them quickly, those two sentences are phonetically identical. You need a little bit of context.

CW: Your boss, Bill Gates, says he expects this problem to be solved within 10 years. Would you agree with that?

MYHRVOLD: I would. I would also — full disclosure — say that if you talked to many leading researchers in the field 10 years ago, they would have said the problem would be solved in 10 years. Ten years is a little like infinity in the computer business.

CW: Why would you want to build a machine that was capable of creative thought?

NEGROPONTE: Think back. Who were the best teachers you had as a kid? Why were they good teachers? They understood you. They were sympathetic at

HAL is born, page 72

HAL IS BORN

> “Actually, the computers we have today wouldn’t lock Dave out of the ship and kill the other guy.” - NATHAN MYHRVOLD

CONTINUED FROM PAGE 71

the right point. They were challenging at the right point. They recognized your facial expressions, your gestures, the puzzled look that you had.

What made the teacher good was the ability to deal with you. That’s what computers do so badly at.

CW: If and when these machines do get invented, will they be capable of competing with humans?

HOGAN: If we could develop machines as intelligent as people, why draw any boundaries there? What’s to keep them from becoming more intelligent?

A lot of the ways humans do things are fudges to overcome quite serious limitations that an engineering approach doesn’t have to be saddled with. For centuries, people were breaking their necks trying to fly — jumping off cliffs and buildings and all kinds of things. But the Wright brothers hit on an approach that is appropriate to engineering. Lo and behold, we’ve got a 747. We may be at the first step toward producing an intelligence that is to a human as a 747 is to a pigeon, and that gets quite sobering.

We’ve created this ability to manufacture enormously complex problems that outstrips our ability to solve them. Perhaps there are some departments we could use some help with — information earth-movers that can plow into these problems and find solutions.

MINSKY: There’d be lots of machines that are similar enough that they would compete. There would be a natural division. Just like there are lions and tigers, and they compete for the same antelopes.

CW: Can you anticipate a point where computers can do a lot of things involved with running a corporation better than people?

MYHRVOLD: Absolutely.

CW: What’s that going to do for our readers and for you and me?

MYHRVOLD: When it comes to thinking or intellectual activities — even paperwork activities — we still have a lot of humans involved. Over time, we’ll find that almost all those tasks will be done by smart programs instead of smart people.

That sounds very science-fictional and very threatening to people, but you could say, “Well, do you get around by foot? No, you use a car. Do you smelt steel by hand? No, you use a giant machine. Do you refine oil by hand? No, you’ve got a refinery.” It needn’t be as threatening as people make it out to be.

CW: If I were a clerk I might feel pretty threatened by it.

MYHRVOLD: The answers are a) don’t hold your breath, and b) there’s probably something else the clerk is more interested in doing. At no time soon are we going to find humans utterly replaceable.

HOGAN: When people are thrown out of work because of $10 chips that do the job — well, obviously, you have to sympathize. But I can’t help asking: If a $10 chip could do the work, what was a human being spending a lifetime doing it for in the first place? Maybe it’s better that the chips do that, and then let’s find out how we can let people actualize themselves in a way that will be fulfilling.

Wagner is Computerworld*’s senior editor, Internet. He can be reached via E-mail at mitch_wagner@cw.com.*

MINSKY ON SOUL

CW: Why do we want to build a machine like this, considering we have 5 billion humans, and growing, who are already capable of thought?

MINSKY: A flip answer is that all the humans are almost the same so it would be nice to have other creatures around with other abilities.

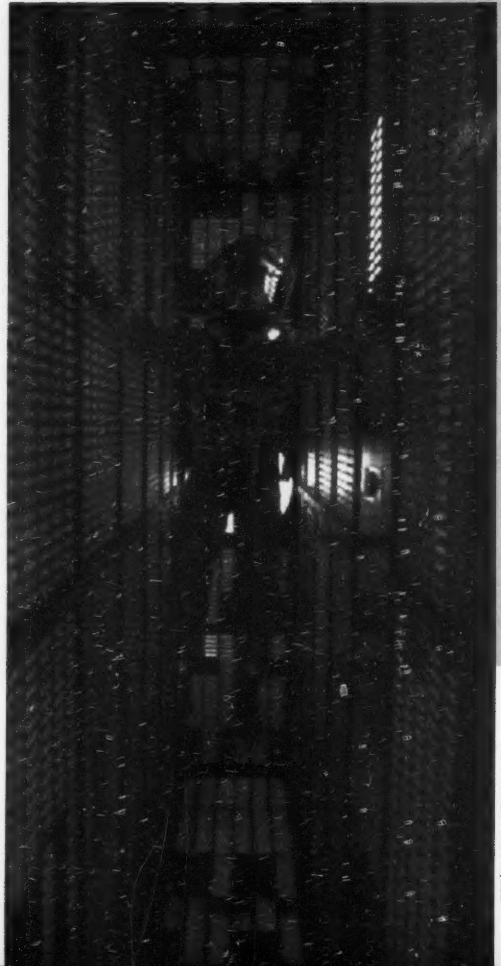
The second answer is, the only way to understand a topic is to build a theory of it, then build a model of your theory and see if it’s correct. Psychologists have lots of theories about things that happen in the mind, but we don’t know if any of those theories works well enough to be considered good.

The third is, if you could understand how to represent the important elements of the human personality, then eventually you could build a scanning machine and extract the essence of the person — the intellect, the theories, the ideas, the way of thinking — and put it in another piece of hardware that would last longer than human bodies.

You would actually build some kind of scanner that examines all your neurons and the connections between them and the chemicals around them. Then you’d build a database and make the database available to something that simulates the machinery.

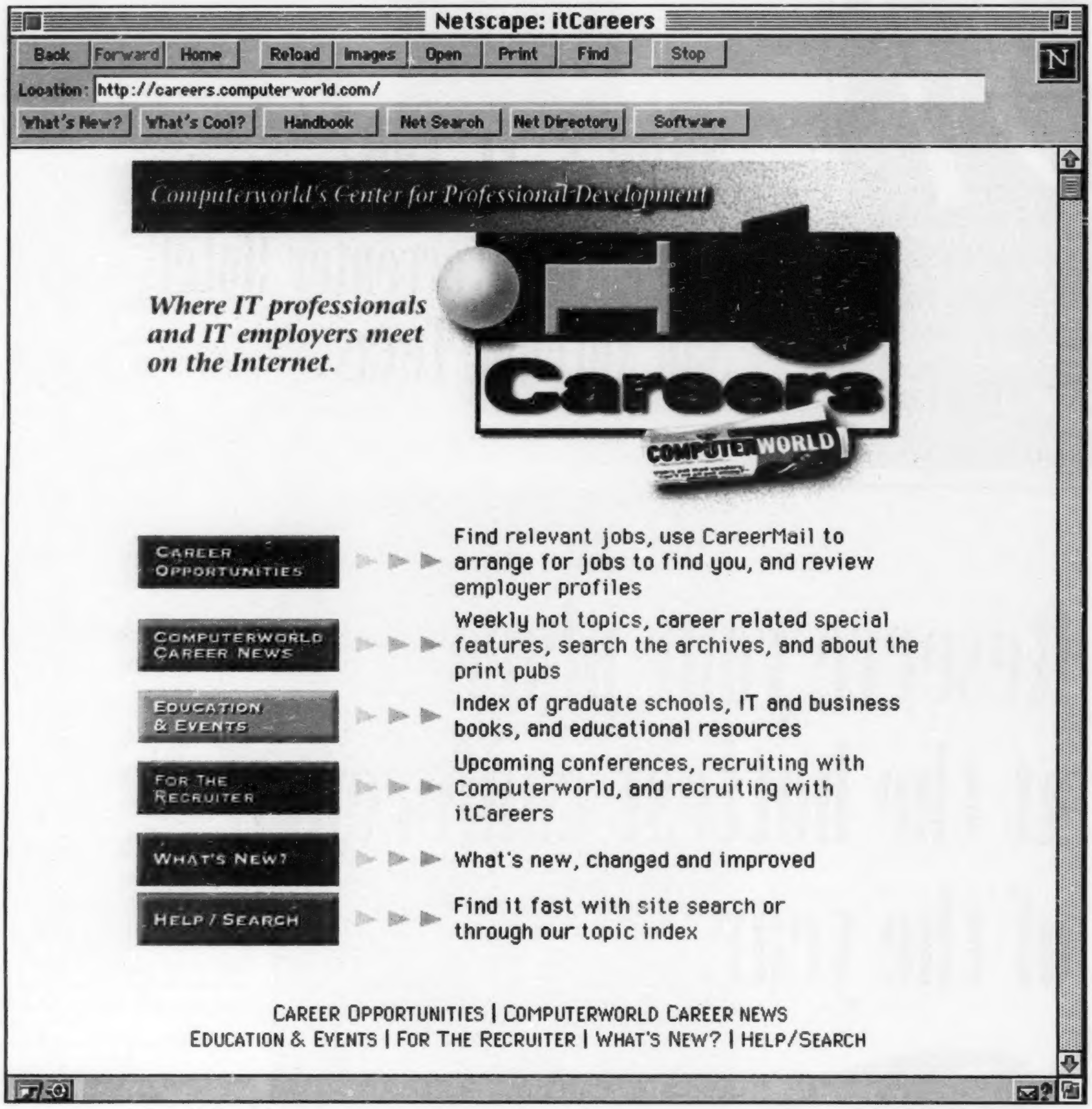
CW: So you don’t think there is a soul there?

MINSKY: If there is a soul and it has no functional properties, then I don’t care. And if it has functional properties, then you can just write a program for it.



MGM/UA HOME ENTERTAINMENT

Artificial intelligence akin to HAL 9000 is inevitable, four experts say



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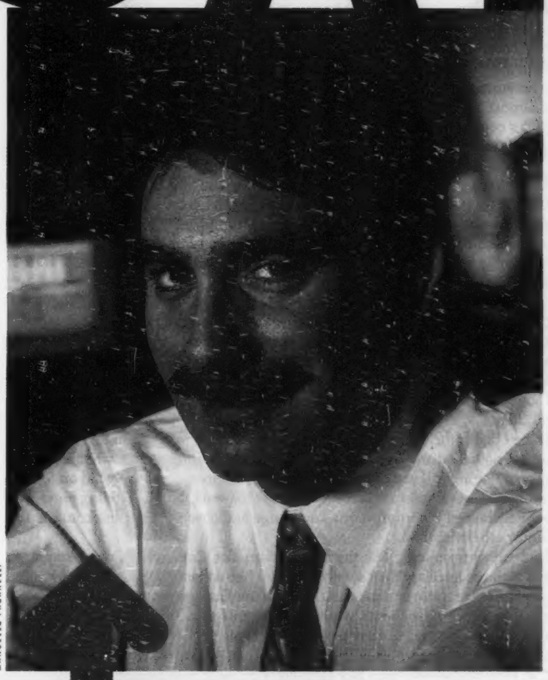

MANUELLO PACANELLI

WARREN GARABEDIAN, 40

By Leslie Goff / Warren Garabedian leveraged his interest in SAP and fluency in German to move into the client/server arena and wound up working for SAP America, Inc. itself. Chris Lee breathed new life into his consulting career when he began working on SAP implementations instead of MVS legacy systems.

Both benefited from an early association with SAP and say demand for experienced SAP consultants will remain robust for the next couple of years. But whether fledgling SAP consultants can still cash in on the market to the extent that early adopters have remains to be seen.

Garabedian says the supply of qualified SAP professionals is catching up to the demand, and the window of opportunity for beginners to rake in the big bucks will narrow over the next 2 years. Lee says existing demand may be peaking, but future versions of SAP will open up new markets in midsize enterprises. He says he sees new opportunity in third-party SAP training.

Computerworld spoke with Garabedian and Lee recently about the past, present and future of SAP consulting.

DIRECTOR OF PLATINUM CONSULTING GROUP
SAP AMERICA IN BOSTON

Past clients: Wellfleet Communications, Inc. (now Bay Networks, Inc.), Computervision, Micrografx, Inc., Convex Computer Corp., NEC Technologies, Inc., Analog Devices, Inc.
Background: Mainframe systems analyst/project manager on an R2 conversion at Siemens/Nixdorf Informationssysteme AG, 1991-92; joined SAP America as a consultant in January 1993

CW: What is the Platinum Consulting Group?

GARABEDIAN: It's an alternative career path for our expert consultants. You must have deep experience with SAP to qualify. It's for people who want to move up the ladder but want to stay close to product implementation.

CW: What's in store for SAP consultants, market-wise? Has demand peaked?

GARABEDIAN: What I see happening, to a small extent, is that the supply is catching up with the demand in the private sector. For our customers, [while] it is still difficult, it's easier now to find SAP-competent consultants. Between SAP America, the big consulting partner firms and independent consultants, the gap is getting smaller.

CW: Has the time passed when IS professionals can cash in on SAP demand?

GARABEDIAN: There's still a window of opportunity to pick up your income. But if you're just starting out — and you figure it will be two years before you're really good — by then the window may be narrowing. But if you're already competent, you could still do really well for another couple of years as an independent consultant. And at SAP, you can do well for the next 20 years.

CW: What do the future employment opportunities look like at SAP America?

GARABEDIAN: We beefed up our consulting staff in two waves of training [in 1996], and we have another big session scheduled [this month]. With all of those combined, we will have increased our head count by 400 consultants. I think after this wave, we'll step back, take a breath and see how things look. So, I honestly don't know if we'll be hiring in the mass that we have been. As a company, we have to digest 400 new people.

But, as we increase SAP functionality — and we're getting into the Internet now with 25 new Internet business APIs — and we're getting more object-oriented, it's hard to say what our needs will be. I believe the Internet applications area will explode. Although it's hard

Sapped strength, page 76

SAPPED STRENGTH

CONTINUED FROM PAGE 75

to predict what the Internet will hold, that's probably where the next SAP opportunities are.

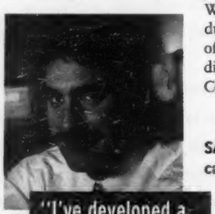
CW: How did you originally come by your SAP expertise?

GARABEDIAN: I had spent five years working for Nixdorf in Germany, so I was certainly aware of it. I was a systems analyst working on mainframe projects. When the company merged with Siemens, I started working on their mainframe-based billing, order entry, financials. We were doing all of our own development work. But not long after the merger, they began moving toward a SAP R2 implementation.

At that point, someone remembered that I was in Germany and spoke fluent German. They needed resources, and I was already familiar with the company's requirements. I came home and went to all the SAP sales and distribution and logistics training. I had prepared some before that by getting Unix and Informix training in Germany.

CW: What was that like — being on the bandwagon so early?

GARABEDIAN: In the early days, there weren't a lot of experienced people around, and getting information when I needed it, on the job at a customer site, was difficult. We have more formal mechanisms in place now, but back then I would look in the system at the program code. The author's name is always listed, so if I had questions about how some code was written, I would call the developer directly. Since I spoke German, I had a foot in the door. It's not something everyone could have done, but I took advantage of having spent time over there.



"I've developed a much broader knowledge base of business and how companies work."

CW: With all the hype about contract SAP positions, why did you choose to work at SAP America?

GARABEDIAN: My overall career plan had been to come up through the IS ranks. I started as an operator during college, came out of school into operations and then began a programming track: programmer, programmer/analyst, senior programmer/analyst, systems analyst, project manager. Eventually I wanted to become a CIO.

I never had to formulate a plan to target the SAP market because it just all happened so fast. Siemens/Nixdorf was not doing well in the States, so our R2 conversion project was put on hold. At the same time, SAP was rolling out R3. I went to their first demonstration of R3, at the Copley Plaza Hotel in Boston, and I was just amazed. It was client/server, it had all this integrated functionality, and the [graphical user interface] was amazing, especially at that point in time.

Then I went back to the office, to my 3270 terminal, and it was just too much of a shock. At that point, I knew I wanted to leap into the future.

So, I contacted my SAP rep, and I let him know I was very interested in working for SAP. He asked for my resume, and later SAP requested a letter from my manager saying it was OK for them to make me an offer. So, I went into his office, closed the door and said I was thinking of leaving, and I wanted to join SAP. He said that seemed reasonable. The opportunities at Siemens were limited, and he didn't mind giving me written permission to pursue the SAP opportunity.

It was a very rapid process because it was so early on — R3 was brand-new in the States, and SAP America was gearing up for a big push. We have a much more structured process now because we have so many people applying to work for us.

CW: How did you move up into your current position?

GARABEDIAN: I started with the company as a sales and distribution applications consultant and went to work for some manufacturing clients. After about 14 months, I became a client manager, which was basically a project manager. Your job is to distribute resources, maintain accounts, set up projects, get involved in presales activities. At this point, I was less involved with implementation.

Next, I became a consulting manager, in May 1995, during an implementation at NEC. I was managing 20 to 30 consultants working on multiple projects. When we reorganized during the first quarter of [last] year, I became director of Platinum Consulting.

CW: What have your SAP skills done for your career financially?

GARABEDIAN: I had set some goals out of college, like I wanted to hit the Social Security limit by 30, and six figures by 40, and so on. It would have taken me a lot longer to hit six figures if I hadn't come to SAP. I just turned 40 [in July].

CW: What do you expect your SAP expertise to do for your future?

GARABEDIAN: I think this experience has given me exposure to a variety of different companies and businesses and that I've developed a much broader knowledge base of business and how companies work. At SAP, I can be involved in dozens of accounts in the course of a year and see the different business philosophies of each. It's like getting an on-the-job MBA.

Goff is a freelance writer in New York.

THE INDEPENDENT VIEW

CHRIS LEE, 51

INDEPE[illegible]T CONSULTANT, WYCKOFF, N.J.

[illegible]ut growing telecommunications firm since April 1996
B[illegible]oftware consultant for 10 years, SAP consultant since 1991

CW: D[illegible]be your current project and your role in it.

LEE: It's an R3 implementation of all the applications modules simultaneously. I'm a developer on a large team, working on interfaces to legacy financial systems. I'll be here about 18 months.

CW: What was your last project before this one? Why were you chosen for this role?

LEE: I was working on a two-year conversion to SAP financials at a large pharmaceuticals company. It required some travel. You can get a lot more work if you're willing to travel way out of town — abroad, across the U.S. The need for talent is everywhere.

I got into IS as a financial user. I spent about eight years as a manufacturing cost accountant before that. In 1981, I went independent as an MSA consultant, and almost all of my work was of a financial flavor. The best background for SAP is a combination of manufacturing and financials because that's typical of an SAP implementation.

CW: What's your take on the current level of demand for SAP expertise?

LEE: Some people feel the demand is peaking. As good as it is, I don't even think it has fully picked up speed. SAP's upcoming Heidelberg project, aimed at smaller companies, will be a scaled-down version of SAP that offers similar functionality but is more affordable. That will open a huge new market of consulting.

CW: How did you come by your SAP expertise? How do you keep up-to-date?

LEE: I stumbled into it. I came in on a conversion from MSA to SAP. It wasn't long before I realized the good end of the project was SAP, not MSA. With the help of some co-workers, I was able to slide over to that end of the project and get some SAP training, which is very hard for an independent consultant to get from clients.

Once I had some background, I had the opportunity to act as an SAP trainer. That strengthened my own background because a good test of whether you know something is if you can teach it. That led me to competitively bid on SAP training for several software firms. I didn't get the work, but the bidding process absolutely helped me improve my knowledge and gave me business contacts I wouldn't otherwise have.

I attend symposiums, like the annual Sapphire Conference, and I stay in touch with the ancillary SAP services market like software testing. By knowing what's out there, I can compare and contrast ancillary products, which puts me in good stead with my clients. And SAP has quite an active home page on the Web. I stay in tune with the business via my clients.

CW: How has becoming an SAP consultant changed your playing field?

LEE: One of the biggest advantages is the prestige of it. You are treated very well by clients because of the expertise you bring in, and you are well-thought-of by your peers in consulting.

Obviously the money is better, but that's only part of the equation. The availability of work on a regular basis is a significant difference. An independent consultant usually has to factor in so many weeks of downtime in a given year. You hope it won't be more than one or two months. With SAP, it becomes more a question of subtracting from 52 weeks the number of weeks you want to vacation and then trying to line up your finish dates with your start dates.

As an SAP consultant, you can just throw your resume in the air and see who grabs it. SAP has become the Cabbage Patch doll of IS consulting.

CW: What compensation and benefits do your SAP skills command relative to what you made as an MSA consultant?

LEE: As an MSA consultant, I could pull in $45 to $60 an hour. With SAP, the range is $80 to $150 an hour, with most jobs coming in at about $100 an hour. And the average duration of assignments before was three to six months, and now it's one to two years.

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Software Engineer (7 Openings) Milwaukee, WI information technology consulting firm seeks individuals to analyze, design, develop, debug & document complex software for new and existing applications in IBM mainframe and PC environments using these technologies: MVS/ESA, JCL, COBOL I and II, CICS, TSO/ISPF, GUI development, and relational databases for mainframes, i.e. DB2. REQUIRES: Bachelor's degree in computer science, computer engineering, OR math, AND 3 years of experience performing the above duties using above technologies. Applicants without required degree who can demonstrate completion of all coursework in major fields of computer science/engineering or math will be considered if they have 1 additional year (total of 4) of work experience in software development using tools listed above. SALARY: $40,000 to 54,000. 40 hr. work week; Mon - Fri/8 am-5 pm. SEND 2 COPIES OF RESUME TO MIKE BROOKS: DWE-ALC; PO Box 7972; Madison, WI 53702-7972. REFER TO CASE NO. 960286.

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Software Engineer: Will develop, test, and troubleshoot application software with Graphic User Interface using C and C++ for embedded system configuration and control. Will design and implement hardware support libraries for plug-in digital video controllers using OOA/OOD method and C++. Will develop firmware and run-time drivers in C and C++ for embedded graphic controllers and maintain 680x0 assembly based graphics driver. Requires Master's degree in Software Engineering or Electrical Engineering. Also requires one year experience in the job to be performed. Education to include completion of a project in which the individual created a digital image display and processing technique using C++ and videodrivers to develop a software package for graphic user interface for digital image capture. Hours 9:00 a.m. - 5:00 p.m. 40 hours per week at $46,000.00 per year salary. Job Location: Wood Dale, IL. Must have proof of legal authority to work permanently in the United States. Please send resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Illinois 60605, Attention: BRENDA KELLY, Reference: #V-IL 16029 - K. AN EMPLOYER PAID AD, NO CALLS - SEND 2 COPIES OF BOTH RESUME & COVER LETTER.

Software engineer to design & develop software systems for business applications including hospital/medical management system, pharmaceutical distributors & personnel management systems; determine client's software requirements for feasibility of design, formulate & design software systems per client needs; use C, Informix-SQL, FoxPro, Informix-4GL on Unix & Netware; Reqs. Bach. in Comp. Sci., Computer or Electrical Engg., Electronic Information Systems or its foreign equiv., 2 yrs exp in job offered or 2 yrs related exp such as Software Engineer, Programmer Analysis or Programmer. Related exp. must include, in whole or part, development, design & testing of software on Unix & Netware platforms using Informix-4GL, Informix-SQL, C, FoxPro, ESQL/C, UNIX systems calls & protocols; & training users; $47,000/yr, 40 hrs/wk 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #133896 "Employer Paid Ad"

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Programmer/Analyst (3 Positions) (Varying work sites in Dallas/Ft. Worth area, TX) Analysis, design & programming of financial/administrative applications software in C++/UNIX/X MOTIF, employing object-oriented methodologies. Development of graphical user interface. 2 yrs exp. in job offered. $55,000/yr., 8-5, M-F, 40 hrs./wk. Apply at the Texas Workforce Commission, Dallas, Texas or send resume to the Texas Workforce Commission, 1117 Trinity, Room 424T, Austin, Texas 78701, J.O. #TX 7856243. Ad paid by an equal opportunity employer.

Senior Programmer/Analyst: Duties: Plan, design, program, develop, and test computer applications, applying knowledge of programming techniques and computer systems; write on-line programs, creating on-line screens and other technologies; conduct feasibility studies; analyze business functions; develop cost-effective solutions; data modeling; database design; consult with users to identify current operating procedures and clarify program objectives; provide system documentation; provide user training and support; prepare and execute system test plans; read manuals, periodicals and technical reports to learn new techniques to develop programs that meet user requirements; formulate plans outlining steps required to develop programs, using structured analysis and design; modify, enhance and customize PRMS packaging running on IBM AS/400 to meet needs of manufacturing plants; develop client-server applications for sales and marketing force; develop Windows applications, using VB, and multi-media tools as a tool for marketing personnel. Applicants must possess B.S. degree in Computer Science. One (1) year experience in the position, or one (1) year experience as a Programmer or Research Assistant, or any combination thereof. Must have taken at least one (1) graduate-level course in each of the following subjects: (1) Data Base Management Systems; (2) Computer Networks; (3) Operating System Software Design; (4) Object-Oriented Languages. Experience in position or related occupation must include: development of interfaces between AS/400 and IBM Mainframe computers; systems administration and applications programming in AS/400 environment, including client-server applications, using Showcase VISTA. 40 hrs./wk.; 9:00 a.m. - 5:00 p.m.; $43,460.00/year. Must have proof of legal authority to work permanently in the U.S. if offer of employment is extended. Send resumes to ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Ilinois. 60605. Attn.: JANET ASCHENBRENNER. Reference# V-IL 15317-A. AN EMPLOYER PAID AD. NO CALLS. SEND 2 COPIES OF BOTH RESUME AND COVER LETTER.

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Programmer Analyst: Programs, designs, and modifies new modules for implementation on billing and order management parts and Order Power software in an AS/400 environment. Performs appropriate design, development, and analysis as well as customize custom implementation on BPCS using SYNON. Will implement and develop a subsystem of Order Power project to customize an Order Information Management System using TRITON UNIX based tools and programming in TRITON C language. Insures systems integrity for integration purposes as well as data retrieval to insure conversion from an IBM mainframe to an AS/400 system using Easytrieve Plus and BAL Assembler. Requires M.S. degree in Computer Science. Education to include completion of a three months internship in which the individual programmed, designed, and developed various conversion programs to perform system migrations and database conversions from IBM mainframe to AS/400 mid-range computer using SYNON and BAL Assembler. Hours: 9:00 a.m. - 5:00 p.m. 40 hours per week at $38,000.00 per year salary. Job Location: Barrington, IL. Must have proof of legal authority to work permanently in the United States. Please send resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Illinois 60605. Attention: Brenda Kelly, Reference # V-IL 16026 - K. AN EMPLOYER PAID AD NO CALLS - SEND 2 COPIES OF BOTH RESUME & COVER LETTER.

Software Engineer (Member of Scientific Staff) to design and develop network management applications to perform Operations, Administration and Maintenance of the CDMA base controller components to comply with CMISE/CMIP standards; implement SS7 communication protocol; perform software configuration management and load-build. Minimum requirements: B.S. degree in Electrical Engineering or Computer Science and 4 years experience In job offered or in software development or an M.S. in Computer Science or Electrical Engineering and 2 years experience or an equivalent combination of advanced education and experience to include use of object oriented techniques of C++ on UNIX platform and at least three of the following: Configuration management with PVCS tool; OS/2 Development; CDMA Protocols; CMISE/CMIP standards; Real Time Development Systems utilizing VX Works; or SS7 Protocol. 40 hrs. Week; Salary $46,000/year. Apply at the Texas Workforce Commission, Dallas, Texas, or send resume to the Texas Workforce Commission, 1117 Trinity, Room 424T, Austin, Texas 78701, Job Order # TX7856394. Ad Paid by An Equal Opportunity Employer.

Programmer/Analyst: Will write, test, develop, and program new products for use by various departments including designs of programs, parameters, and writing of program specifications. Will develop programs using appropriate CASE tools and software to enable conversion of a mainframe-based order system to an AS/400 processing system. Designs, writes and develops appropriate protocols and analyzes conversion systems using SYNON/2E CASE tools to insure system integrity using principles of applied data including programming of RPG400 and COBOL to insure conversion. Responsibilities also include coding and testing modules, developing test plans, providing production support, designing screens and reports, and developing program specifications. Requires Bachelor's degree in Computer Science. Also requires one year and six months experience in the job to be performed. Hours: 9:00 a.m. - 5:00 p.m. 40 hours per week at $48,000.00 per year salary. Must have proof of legal authority to work permanently in the United States. Please send resume to: Diane J. Thessen, Information Services Human Resource, Wallace Computer Services, 4600 West Roosevelt Road, Hillside, Illinois 60162. No calls.

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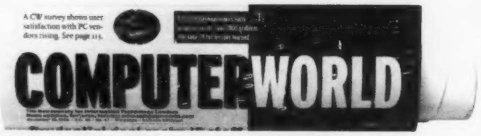
A CW survey shows user satisfaction with PC vendors rising. See page 113.
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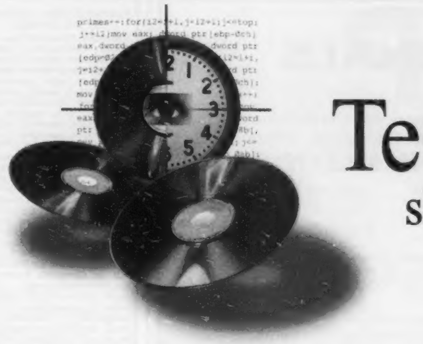

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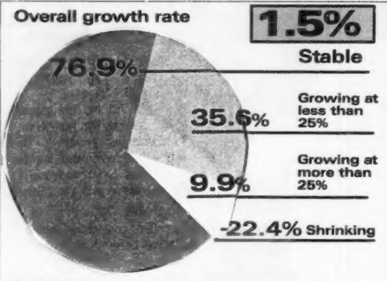

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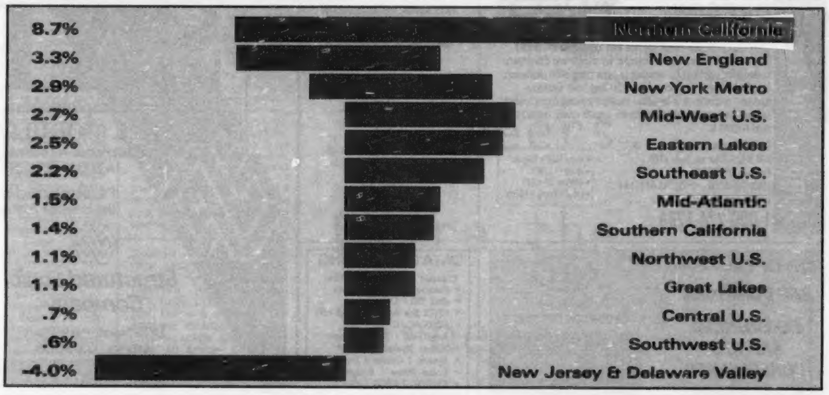

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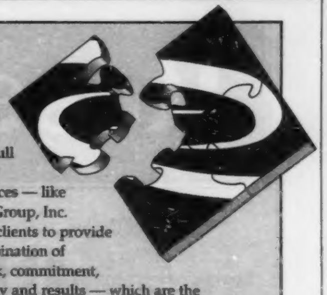

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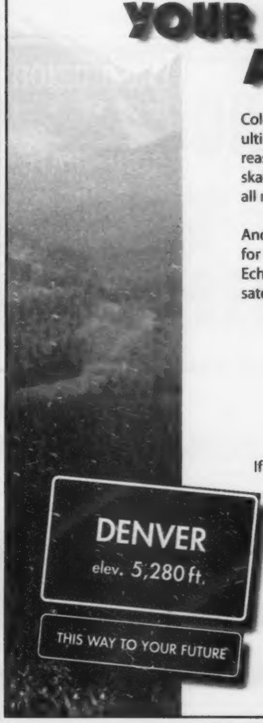

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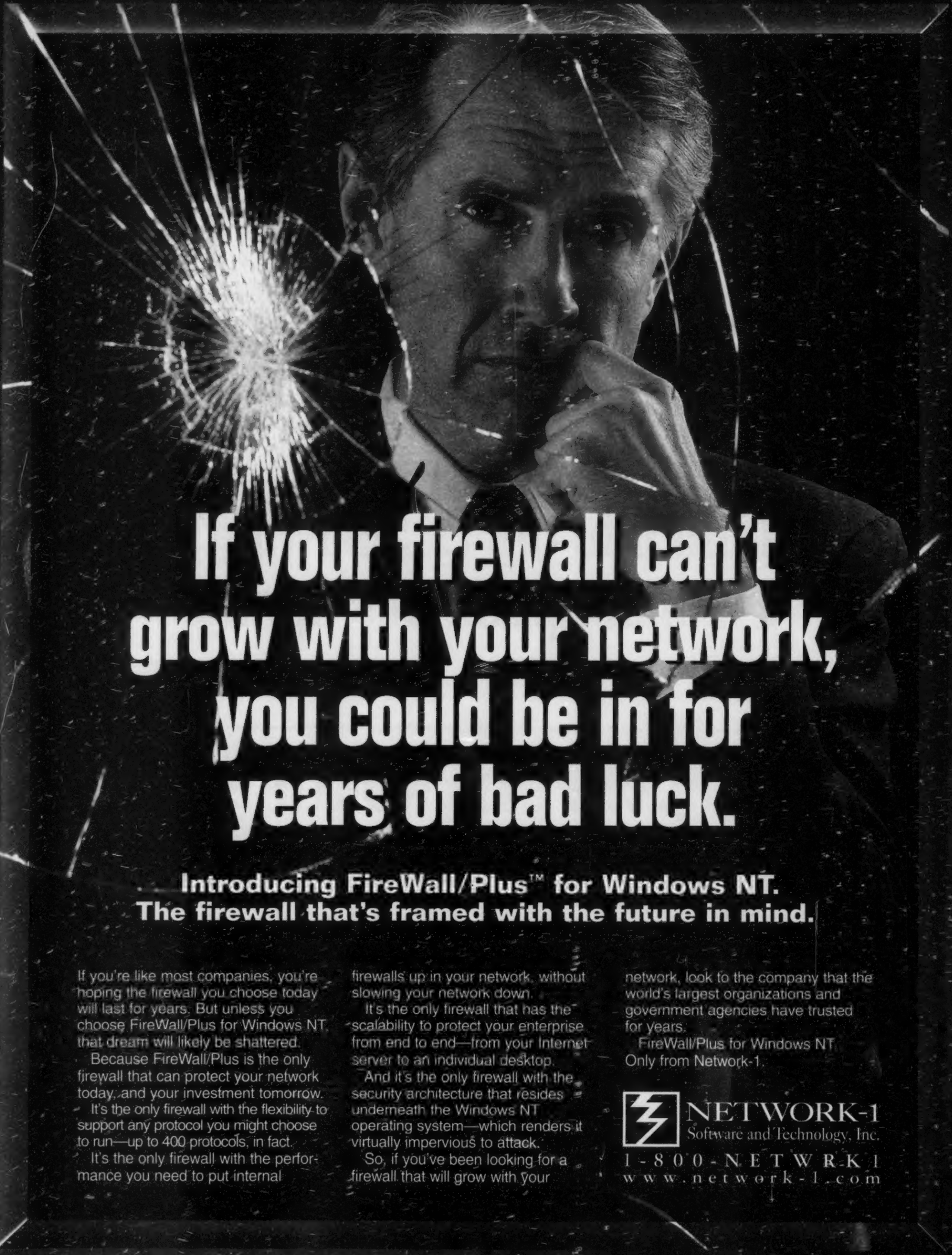

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Marketplace

TECHNOLOGY ROUNDUP

HANDHELDS GRASP FOR ACCEPTANCE

By Suruchi Mohan

FOR AT LEAST five years, the market for personal digital assistants (PDA) or whatever else you call them — pen-based, palmtop or handheld computers — has been on the verge of taking off. But it hasn't happened yet, and analysts have had to track a lackluster market instead.

The reason is that "manufacturers don't understand how people use these devices," says Ken Dulaney, vice president of mobile computing at Gartner Group, Inc. in San Jose, Calif. Vendors "are trying to optimize battery life and price, but they need to optimize functionality. That's why the market is languishing."

But it seems that manufacturers are finally beginning to get it. Handhelds are "not meant to replace laptop or desktop computers," says Diana Hwang, senior industry analyst at International Data Corp. in Framingham, Mass. "They are not really designed for that. That's changing, and vendors understand [that these devices] are a supplement to the main device rather than the main device."

Handhelds are a supplement to the main device rather than the main device.

Consequently, competition has increased and the market has become more segmented as it tries to cater to the needs of different classes of users. If users want only an organizer, they can buy something small that fits into a pocket such as Pilot from U.S. Robotics Corp., according to Phillip Redman, an analyst at The Yankee Group, Inc. in Boston.

If, on the other hand, they also want word processing, they will have to go with something a little bigger such as a Zaurus from Sharp Electronics Corp. or an HP 200LX from Hewlett-Packard Co., Redman says.

How the market is segmented still depends on whom you talk to. Mike McGuire, senior analyst for mobile computing at Dataquest in San Jose, says the handheld market is the sum of expandable organizers, such as Zaurus, and standard handhelds, such as Pilot and Apple Computer, Inc.'s MessagePad. The expandable organizers tend to use proprietary operating systems with tightly controlled third-party support.

If you need more memory, for example, you have to go to the device's vendor. Standard handhelds use operating systems that can be licensed. Development tools for these are based on industry standards. Recently, Microsoft Corp. introduced Windows CE, a scaled-down version of Windows 95 that was designed specifically for handhelds.

Hwang says the handheld market can be divided into three segments: pen-based, the personal companion and the high-end organizer/PC companion. Pen-based handhelds include Envoy and Marco wireless communicators from Motorola, Inc. Personal companions include Pilot. And high-end organizers include HP 200LX, Zaurus and devices based on Windows CE.

Microsoft's new operating system has generated a healthy interest in this market, analysts say. The real importance of Windows CE is illustrated by the entry of new hardware players — Hitachi Ltd., NEC Corp., Compaq Computer Corp. and Philips Consumer Electronics Co. — into the market, McGuire says.

Perhaps most important, Windows CE will remove a barrier — which was created by the use of proprietary operating systems — to the acceptance of portable devices, Redman says. As the market matures, it will move to a communications-centric paradigm, but now it is computing-centric. And the future, according to Redman, lies in communications — in having the capability to use handhelds for wired and wireless communications.

Mohan is a freelance writer in Los Altos, Calif.

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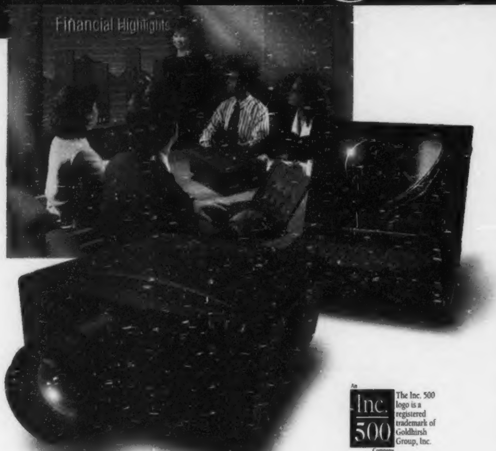

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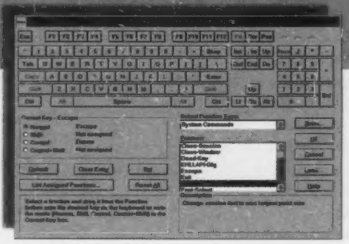

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Scanning the 1997 horizon

Last year was intoxicating for technology stock investors. Although some pure-play Internet vendors and chip stocks took a pounding, much of the high-tech sector rose like champagne bubbles and runaway New Year's Eve balloons. Hoping to catch, or at least look for, some rising stars in 1997, *Computerworld* asked several Wall Street analysts which stocks they thought were worth watching in the new year.

Irwin Silverberg, an analyst at Burnham Securities, Inc. in New York, picked one of last year's downtrodden stocks as one to watch this year. Shares of Interleaf, Inc. (Nasdaq:LEAF), a developer of document management software, are priced "as if it's going bankrupt," Silverberg says. "But they're a long way from it. This is a sector in the early stages of development, and the leader, Documentum, is not any bigger than Interleaf."

A handful of other "angels with dirty faces" bear watching in 1997, says Michael Geran, an analyst at a division of Donaldson, Lufkin & Jenrette Securities Corp. in Jersey City, N.J. Digital Equipment Corp. (NYSE:DEC), Unisys Corp. (NYSE:UIS) and Data General Corp. (NYSE:DGN) are each possible candidates for turnarounds this year.

As the calendar turns another page, Bill Loomis, an analyst at Ferris, Baker Watts, Inc. in Baltimore, says this will be the year that year 2000 problems "turn into real cash" for companies that provide year 2000 cleanups. Keane, Inc. (AMEX:KEA), Computer Horizons Corp. (Nasdaq:CHRZ), Computer Task Group (NYSE:TSK) and Analysts International Corp. (Nasdaq:ANLY) are all in good position to win some of the contracts in the $50 million and higher range, Loomis says.

Large computer services' "mega-contracts" are always up for grabs, and this year investors should keep an eye on Electronic Data Systems Corp. (NYSE:EDS). "EDS may have been distracted in 1996 by their separation from [General Motors Corp.], but I think they'll come back swinging in '97," Loomis says

In the Internet sector, Loomis says to watch Information Resources Engineering, Inc. (Nasdaq:IREG), a Baltimore developer of encryption systems that already supplies the Federal Reserve and many of the country's largest banks with encryption technology.

This should also be an interesting year for personal Internet news services Individual, Inc. (Nasdaq:INDV) and Desktop Data, Inc. (Nasdaq:DTOP) — companies that push customized news feeds to subscribing users — according to David Takata, an analyst at Gruntal & Co. in Beverly Hills, Calif. If you are about to bubble over with excitement over network computers, Takata says to raise a glass for device manufacturers Network Computing Devices, Inc. (Nasdaq:NCDI), SunRiver Corp. (Nasdaq:SRVC), and network computer software developer TriTeal Corp. (Nasdaq:TEAL). — Stewart Deck

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GTE	49.25	37.75	GTE Corp.	45.13	1.88	4.3
LU	53.13	29.75	Lucent Tech.	46.25	-2.00	-4.1
MADGF	46.63	8.13	Madge Networks NV	10.38	-0.25	-2.4
MCIC	33.88	22.38	MCI Commmunications Corp. (H)	33.50	1.38	4.3
MNPI	34.50	5.50	Microcom Inc.	11.50	-2.00	-14.8
NETM	23.38	5.38	NetManage Inc.	6.50	0.38	6.1
NTRX	10.88	3.75	Netrix Corp.	4.69	-0.56	-10.7
NCDI	11.25	2.88	Network Computing Devices	9.88	-0.63	-6.0
NWK	36.00	11.13	Network Equipment Tech.	16.50	1.00	6.5
NETG	30.25	15.00	Network General (H)	29.00	1.88	6.9
NN	37.25	20.13	Newbridge Networks Corp.	28.38	-0.63	-2.2
NT	67.63	40.75	Northern Telecom Ltd.	63.00	0.75	1.2
NOVL	15.63	8.75	Novell Inc.	10.00	0.13	1.3
NYN	59.25	42.00	Nynex Corp.	49.63	2.88	6.1
OCTL	31.75	12.63	Octel Communications Corp.	17.00	-0.88	-4.9
ODSI	29.00	11.25	Optical Data Systems Inc. (L)	13.25	1.13	9.3
PAC	39.00	25.88	Pacific Telesis (H)	36.88	1.25	3.5
PCTL	44.72	23.38	Picturetel Corp. (L)	26.13	2.00	8.3
PTON	7.50	2.06	Proteon Inc.	3.06	0.38	14.0
RACO	7.00	3.50	Racotek Inc.	4.38	0.13	2.9
RETX	10.88	1.88	Retix	7.50	-0.13	-1.6
SBC	60.25	46.00	SBC Communications	52.75	1.88	3.7
SFA	20.38	12.00	Scientific Atlanta Inc.	15.63	-0.25	-1.6
SHVA	87.25	25.13	Shiva Corp.	35.50	-2.00	-5.3
FON	45.50	34.50	Sprint Corp.	39.88	1.13	2.9
SMSC	18.75	8.38	Standard Microsystems Corp.	9.63	0.38	4.1
USRX	105.50	32.75	US Robotics	68.00	-5.25	-7.2
USW	37.50	27.25	U S West Inc.	32.50	1.00	3.2
XIRC	23.75	9.50	Xircom (H)	21.25	-1.13	-5.0
XYLN	76.00	23.50	Xylan Corp. (L)	29.88	3.50	13.3
PCs and Workstations						**OFF 2.06%**
AALR	15.25	5.88	Advanced Logic Research	13.00	-0.75	-5.5
AAPL	35.50	16.00	Apple Computer Inc.	21.75	-1.13	-4.9
ASTA	9.00	3.94	AST Research Inc.	4.63	-0.25	-5.1
CPQ	87.13	35.88	Compaq Computer Corp.	74.38	-2.25	-2.9
DELL	64.38	11.50	Dell Computer Corp.	54.13	-1.00	-1.8
GATE	66.25	18.00	Gateway 2000 Inc.	52.88	-5.38	-9.2
HWP	57.75	36.88	Hewlett Packard Co.	51.50	0.00	0.0
MUEI	23.50	8.75	Micron International Inc.	19.63	1.13	6.1
NIPNY	65.00	49.88	NEC America	60.75	1.63	2.7
SGI	30.38	17.88	Silicon Graphics	25.88	-0.88	-3.3
SUNW	35.13	18.00	Sun Microsystems Inc.	27.75	-2.25	-7.5
Large Systems						**UP 1.73%**
AMH	14.00	6.75	Amdahl Corp.	12.50	-0.50	-3.8
DGN	19.13	9.00	Data General Corp.	15.13	0.25	1.7
DEC	76.50	28.38	Digital Equipment Corp.	36.25	-3.13	-7.9
IBM	166.00	83.13	IBM	157.38	1.88	1.2
MDCD	20.25	6.25	Meridian Data Inc.	6.56	0.06	1.0
NETF	6.38	2.25	NetFrame (L)	2.94	0.31	11.9
SQNT	18.63	10.13	Sequent Computer Sys. (H)	17.75	0.75	4.4
SEQS	5.88	1.88	Sequoia Systems Inc.	2.19	-0.06	-2.8
SRA	34.88	16.63	Stratus Computer Inc.	28.63	2.13	8.0
TDM	15.25	8.38	Tandem Computers Inc.	13.63	0.00	0.0
UIS	9.13	5.38	Unisys Corp.	7.25	0.38	5.5
Software						**UP 0.05%**
ADBE	64.25	28.50	Adobe Systems Inc.	38.69	-2.56	-6.2
AMSWA	7.13	3.63	American Software Inc.	6.63	0.06	1.0
APLX	42.50	18.13	Applix Inc.	23.81	2.94	14.1
ARSW	82.75	21.00	Arbor Software	27.06	2.81	11.6
ADSK	44.25	18.50	Autodesk Inc.	29.13	0.94	3.3
BGSS	27.38	14.88	BGS Systems Inc. (H)	24.25	-1.75	-6.7
BMCS	46.75	18.63	BMC Software Inc.	42.50	-1.50	-3.4
BOOL	25.25	13.25	Boole and Babbage (H)	24.50	4.00	19.5
BORL	21.25	4.75	Borland Int'l Inc.	6.00	0.06	1.1
BOBJY	55.50	8.63	Business Objects	14.75	1.50	11.3
CAYN	11.88	3.81	Cayenne Software Inc. (L)	4.38	0.06	1.4
CNTR	7.13	2.63	Centura Software	2.75	-0.38	-12.0
COGNF	39.50	11.13	Cognos Inc.	28.25	-1.38	-4.6
CA	67.88	33.88	Computer Associates	47.25	-15.88	-25.1
CVN	15.25	5.75	Computervision Corp.	9.25	0.00	0.0
CPWR	62.25	15.50	Compuware Corp.	53.50	-3.50	-6.1
CSRE	32.00	10.75	Comshare Inc.	17.50	1.38	8.5
COSFF	13.88	6.56	Corel Corp.	7.56	0.06	0.8
DWTI	9.75	2.63	Dataware Technologies Inc.	3.13	-0.13	-3.8
FILE	67.00	20.00	Filenet Corp.	23.63	-8.63	-26.7
FRTE	81.75	24.75	Forte Software	33.00	-0.25	-0.8
FTPS	29.38	4.88	FTP Software Inc.	6.38	-0.38	-5.6
HUMCF	47.63	23.00	Hummingbird Comm. Ltd.	29.00	0.25	0.9
HYSW	25.00	9.75	Hyperion Software Corp.	23.13	1.50	6.9
IRIC	16.25	11.00	Information Resources	14.44	0.31	2.2
IFMX	36.75	16.88	Informix Corp.	20.25	-0.63	-3.0
INGR	20.13	8.63	Intergraph Corp.	10.50	-0.13	-1.2
LEAF	10.38	1.81	Interleaf Inc. (L)	2.44	0.31	14.7
ISLI	16.38	7.50	Intersolv Inc.	9.75	-0.25	-2.5
INTU	78.00	25.88	Intuit Inc.	32.13	-1.50	-4.5
TLC	30.31	13.38	Learning Co. (The)	16.13	0.25	1.6
LGWX	22.25	5.25	Logic Works (L)	5.63	-0.31	-5.3
MAPS	21.00	7.50	MapInfo Corp.	11.06	1.06	10.6
MATH	9.25	3.25	MathSoft	3.63	-0.56	-13.4
MCAF	52.88	14.00	McAfee Associates	44.75	-2.75	-5.8
MENT	18.50	7.38	Mentor Graphics	9.88	0.13	1.3
MIFGY	21.25	8.25	Micro Focus	15.88	1.25	8.5
MGXI	18.63	5.00	Micrografx Inc.	5.75	0.38	7.0
MSFT	86.13	40.00	Microsoft Corp. (H)	83.13	-1.56	-1.8
ORCL	51.00	26.38	Oracle Corp.	43.75	0.88	2.0
PMTC	56.75	25.88	Parametric Technology	53.50	-0.88	-1.6
PARQ	14.63	2.25	ParcPlace Systems Inc.	2.44	-0.06	-2.5
PSFT	52.25	17.13	Peoplesoft (H)	48.50	-2.75	-5.4
PTEC	20.38	12.50	Phoenix Technologies	16.00	-0.13	-0.8
PSQL	13.50	3.13	Platinum Software	12.00	0.63	5.5
PLAT	18.75	9.25	Platinum Technology	14.50	0.50	3.6
PRGS	37.75	12.13	Progress Software Corp.	20.00	0.75	3.9
RNBO	24.25	14.63	Rainbow Technologies Inc.	19.56	-0.94	-4.6
REDB	61.00	17.13	Red Brick Systems Inc. (L)	21.50	2.25	11.7
SAPE	58.25	29.25	Sapient Corp.	42.13	1.13	2.7
SCOC	9.13	5.50	SCO Inc.	7.13	-0.13	-1.7
SDTI	54.50	21.25	Security Dynamics Tech.	32.88	-2.44	-6.9
SPCO	3.50	0.94	Software Publishing Corp. (L)	1.06	-0.06	-5.6
SQAX	39.75	17.50	SQA Inc.	32.38	0.63	2.0
SOTA	19.75	9.19	State of the Art	12.75	-0.75	-5.6
SSW	81.38	28.25	Sterling Software Inc.	31.75	-0.13	-0.4
SDRC	37.38	15.00	Struct. Dynamics Research	19.69	-0.94	-4.5
SYBS	37.38	13.50	Sybase Inc.	17.31	-0.56	-3.1
SYMC	23.13	8.75	Symantec Corp.	15.63	1.13	7.8
SNPS	50.50	27.50	SynOpsys	45.25	1.25	2.8
SSAX	26.75	8.25	System Software Assoc.	11.00	0.44	4.1
SYSF	36.50	4.38	Systemsoft Corp.	16.63	1.38	9.0
TRUV	9.63	2.44	Truevision Corp. (L)	3.13	0.13	4.2
VIEW	17.50	8.38	ViewLogic Systems	11.38	0.38	3.4
VMRK	12.63	5.50	VMark Software Inc.	7.63	0.13	1.7
WALK	15.63	6.88	Walker Interactive Systems	13.00	-0.75	-5.5
WALL	27.50	12.25	Wall Data Inc.	15.00	-1.13	-7.0
WANG	26.13	15.38	Wang Laboratories Inc.	20.13	1.25	6.6
Internet						**OFF 1.22%**
AOL	71.00	22.38	America On-Line	33.75	-3.00	-8.2
BBN	40.88	15.63	BBN Corp.	22.38	-0.13	-0.6
CSRV	35.50	8.63	Compuserve Corp.	10.50	-0.63	-5.6
EDFY	55.75	13.38	Edify Corp.	15.13	1.63	12.0
LCOS	29.25	5.75	Lycos Inc.	10.75	-1.50	-12.2
NETC	44.50	12.25	Netcom On-Line (L)	13.88	-0.88	-5.9
NSCP	86.00	34.50	Netscape Comm. Corp.	56.75	3.50	6.6
OMKT	42.25	11.50	Open Market Inc.	15.31	1.56	11.4
PSIX	22.75	6.75	PSINet	11.25	0.63	5.9
QDEK	27.88	3.94	Quarterdeck Corp.	4.38	-0.25	-5.4
RAPT	39.25	12.75	Raptor Systems	19.88	-1.50	-7.0
SCUR	56.00	7.63	Secure Computing Corp.	9.00	0.25	2.9
SPYG	55.75	10.00	Spyglass Inc.	12.13	-2.63	-17.8
YHOO	43.00	15.50	Yahoo! Inc.	18.38	1.13	6.5
Semiconductors						**UP 0.60%**
AMD	28.38	10.25	Advanced Micro Devices	27.50	1.13	4.3
ADI	35.50	17.00	Analog Devices Inc.	34.63	1.00	3.0
CHPS	26.50	8.00	Chips and Technologies	18.88	0.50	2.7
CRUS	27.25	12.63	Cirrus Logic	16.13	-0.88	-5.1
CY	16.63	9.13	Cypress Semiconductor Corp.	14.63	0.13	0.9
CYRX	36.50	11.50	Cyrix	19.63	0.00	0.0
INTC	141.50	49.81	Intel Corp.	135.38	-0.13	-0.1
LSI	39.63	17.00	LSI Logic Corp.	27.88	-0.50	-1.8
LSCC	47.00	19.75	Lattice Semiconductor	45.13	2.50	5.9
MCRL	35.00	12.00	Micrel Semiconductor Inc.	32.75	3.50	12.0
MU	69.38	16.63	Micron Technology	30.75	-0.13	-0.4
MOT	68.50	44.13	Motorola Inc.	61.38	3.75	6.5
NSM	27.63	13.00	National Semiconductor	24.50	-1.38	-5.3
TXN	68.38	40.50	Texas Instruments	64.75	1.38	2.2
VLSI	29.25	10.38	VLSI Technology	23.13	-0.81	-3.4
XLNX	46.50	24.50	Xilinx	37.88	-1.00	-2.6
ZLG	40.38	14.88	Zilog Inc.	26.50	-2.00	-7.0
Peripherals and Subsystems						**UP 0.23%**
APCC	28.13	7.88	American Power Conversion (H)	27.13	-0.63	-2.3
ADPT	41.13	17.50	Adaptec Inc.	38.75	0.00	0.0
CBEX	8.25	1.50	Cambex Corp.	1.88	-0.63	-25.0
CREAF	11.88	3.50	Creative Technology Ltd. (H)	11.13	1.75	18.7
RACE	24.50	3.75	Data Race Inc. (H)	22.75	4.50	24.7
DTM	9.38	4.13	Dataram Corp. (H)	9.38	1.25	15.4
EMC	36.38	15.13	EMC Corp. (H)	33.50	-0.38	-1.1
EMLX	21.38	6.38	Emulex Corp.	15.50	-1.00	-6.1
ESCC	29.00	19.00	Evans and Sutherland	26.50	2.25	9.3
EXBT	22.75	11.63	Exabyte	13.88	-1.00	-6.7
IISLF	4.13	1.38	Intelligent Info. Systems	1.75	0.25	16.7
IOM	55.13	5.75	Iomega Corp.	16.88	-1.38	-7.5
IPLS	8.25	1.25	IPL Systems Inc. (L)	1.69	0.31	22.7
KMAG	37.00	17.63	Komag Inc.	26.75	1.00	3.9
MTSI	29.75	11.25	MicroTouch Systems Inc. (H)	25.00	-3.13	-11.1
PEAK	31.25	10.13	Peak Technology Group	11.38	-0.13	-1.1
PNCL	16.50	2.00	Pinnacle Micro Inc. (L)	2.56	-1.00	-28.1
AQM	6.75	3.75	QMS Inc.	5.63	0.25	4.7
QNTM	30.63	10.88	Quantum Corp.	27.88	-0.25	-0.9
RDUS	4.88	0.44	Radius Inc.	0.50	-0.06	-11.1
SEC	42.75	18.13	Seagate Technology	38.88	-0.38	-1.0
STK	52.00	22.00	Storage Technology	46.50	-1.00	-2.1
STLC	8.75	0.63	Streamlogic Corp. (L)	0.69	-0.06	-8.3
TEK	52.25	29.75	Tektronix Inc. (H)	50.88	-0.75	-1.5
WDC	63.38	16.13	Western Digital Corp.	57.50	0.38	0.7
XRX	58.25	39.88	Xerox Corp.	52.50	1.63	3.2
Services						**UP 0.84%**
AMSY	37.13	18.25	American Mgmt. Systems	24.19	0.06	0.3
ANLY	30.50	13.63	Analysts Int'l (H)	27.50	-1.13	-3.9
AUD	45.75	35.63	Auto Data Processing	43.25	0.25	0.6
BDMI	61.50	25.44	BDM International Inc.	54.50	5.25	10.7
CATP	37.25	14.63	Cambridge Tech. Partners	31.13	-0.13	-0.4
CEN	54.88	37.00	Ceridian Corp.	39.50	-1.50	-3.7
CDO	33.00	19.88	Comdisco Inc.	31.00	-0.38	-1.2
CHRZ	54.00	15.00	Computer Horizons	37.50	2.25	6.4
CSC	86.50	64.13	Computer Sciences	79.75	-1.63	-2.0
TSK	43.63	16.75	Computer Task Group (H)	41.75	0.63	1.5
CPU	30.88	6.50	CompUSA Inc.	15.50	-5.50	-26.2
CDAT	28.63	12.75	Control Data Systems Inc.	22.88	1.38	6.4
EGGS	13.88	4.75	Egghead Discount Software	5.38	-0.25	-4.4
EDS	63.38	40.75	Electronic Data Systems Corp.	43.38	-0.75	-1.7
INAC	40.63	13.25	Inacom Corp. (H)	38.88	0.75	2.0
INEL	11.50	3.50	Intelligent Electronics	8.63	0.75	9.5
KEA	32.88	10.13	Keane Inc. (H)	31.75	5.00	18.7
MICA	25.00	7.50	Microage Inc.	20.75	0.13	0.6
PAYX	63.63	30.63	Paychex	50.25	2.63	5.5
PMS	55.50	33.13	Policy Management Sys.	45.00	1.00	2.3
REY	28.25	18.25	Reynolds and Reynolds	25.88	0.13	0.5
SCBI	30.50	14.44	SCB Computer Tech. Inc.	18.25	0.00	0.0
SEIC	26.38	17.75	SEI Corp.	22.50	1.19	5.6
SMED	72.13	42.25	Shared Medical Systems	49.56	-0.31	-0.6
SSPE	32.25	17.00	Software Spectrum Inc.	28.75	-1.00	-3.4
VST	29.75	9.00	VanStar Corp.	24.63	0.25	1.0
SNDT	47.50	27.50	Sungard Data Systems	40.00	-0.50	-1.2

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Year 2000 boot camp

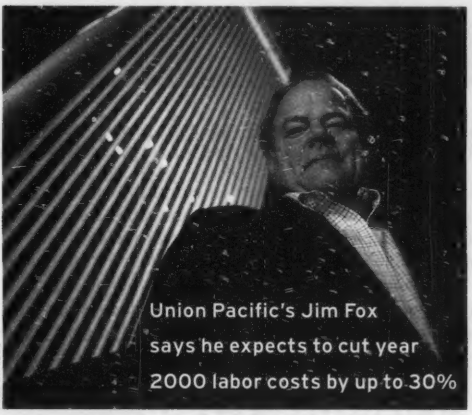
▸ *Omaha business community innovates to combat IS shortage*

By Julia King

OMAHA BUSINESSES have come up with a novel way to combat the shortage of year 2000 information systems professionals — a Cobol boot camp.

It was designed to rapidly transform teachers, retail clerks and other nontechnical twenty- and thirtysomethings into a fresh source of programmers for year 2000 work.

It also promises to save local companies a bundle in year 2000 contractor costs.



Union Pacific's Jim Fox says he expects to cut year 2000 labor costs by up to 30%

KENT SIEVERS

"Our theory is that there's a lot of underemployed college graduates in the market who have the potential to do technical work and would be interested," said Jim Schmidt, a senior vice president at the IS unit of First National Bank of Omaha.

Companies are primarily looking in and around Omaha for the new Cobol recruits, but they are also casting a wider net by advertising the accelerated program and hundreds of other Omaha IS job opportunities on the Internet (www.omaha.org).

"So many of our companies require technical talent that we're all kind of fighting each other. The year 2000 has created a shortage in one particular skill set that was already short," Schmidt said.

Supported by a consortium of large businesses, which also includes Union Pacific Railroad and Mutual of Omaha Co., the boot camp aims to get new year 2000 workers on the job after seven months of intensive full-time training in programming logic, CICS, assembler and other mainframe skills.

After that, students work full-time at a starting salary of $30,000 annually and continue their studies part-time, at the expense of their new employer, for the next 17 months.

Contractors' rates, by contrast, range from $45 to $60 per hour, or $93,600 to $124,800 annually.

To keep people on board once the year 2000 work is completed, several companies, including Union Pacific, agree to provide Cobol recruits with additional training in newer systems and technologies.

Classes have yet to begin, but companies already have committed to hiring 100 students.

The training, which will be delivered via satellite by top IS educators, starts later this month. The classes will be offered through Creighton Institute for Information Technology and Management, which was formed earlier this year specifically to train professionals in IS skills required by Omaha's big companies.

"The idea was for students and the companies to share the risk of education," said Mike Echols, a former General Electric Co. executive and Creighton's executive director.

"It's seven months of real intense work, but the individual knows what the economic payback is at the end of the seven months," Echols said.

Union Pacific's strategy is to pair a seasoned IS staffer with each hired student. They would work on six different year 2000 projects already under way.

Projects range from reprogramming embedded software in trackside signaling equipment to checking newer client/server applications for possible year 2000 glitches.

Union Pacific already has hired several contractors for year 2000 work. By hiring students, IS director Jim Fox said he expects to cut year 2000 labor costs by as much as 30%.

But even more beneficial is the influx of new IS talent that the railroad might not have been able to recruit otherwise.

Life in Omaha

In the Cold War days, Omaha's extensive and ultrasophisticated communications infrastructure served the U.S.' mighty Strategic Air Command.

Today, its primary users are dozens of telemarketing companies and financial service firms, which, among other things, process more than half of the nation's credit-card transactions.

All of that translates into an abundance of IS job opportunities.

But what is it like to live in Omaha?

For starters, there are no traffic jams. And with unemployment at 2.4%, even burger flippers can earn $7 to $8 per hour, according to locals.

On the sports front, there are no major league teams, which is why Omaha is home to a lot of Denver Broncos and Minnesota Vikings fans.

"But there is a symphony, a lot of theater productions and a tremendous sense of community pride," said Chief Information Officer Donald Liedtke, who moved to Omaha from Memphis six and a half years ago to head up IS at Guarantee Life Insurance Co. — Julia King

FAST FACTS ABOUT YEAR 2000

- 60% of managers surveyed in 1995 had already experienced year 2000 problems
- One-third of IS managers plan to replace noncompliant software with new software packages
- Year 2000 issues will trigger more than $1 trillion in lawsuits in the U.S.
- More than half of all companies worldwide will not be year 2000-ready by the end of 1999

Sources: Platinum Technology, Inc., International Data Corp., American Bar Association, Gartner Group, Inc.

Cobol crash course

CONTINUED FROM PAGE 1

Cobol in 21 Days and president of King Computer Services, Inc., a consultancy in Tujunga, Calif.

Not surprisingly, other programming experts are skeptical. It is very possible for a programming neophyte to learn Cobol in three weeks, they said. But it is questionable whether that same person would be ready to go help fix real-life year 2000 programming problems.

YEAR 2000 PROBLEM

"What you need to do year 2000 work isn't just Cobol," said Janet Ruhl, a former IBM software engineer and author of two books on becoming a computer consultant.

Ruhl said year 2000 work also requires knowledge of the IBM mainframe software suite, including VSAM and MVS, and a company's particular mainframe editor system. "There's a whole lot of stuff that has nothing to do with Cobol," she said.

Sheldon Glasser, a 35-year Cobol programming veteran and president of R. Dunn Consulting, a computer consultancy in Newmarket, Ontario, suggested that companies assign the 21-day Cobol graduates to maintenance work. That would free up experienced programmers to work on more complex year 2000 problems.

"The smart thing to do is hire a bunch of younger or older programmers, teach them Cobol and have them do some of the simpler stuff," Glasser said. This includes linking mainframe programs, such as payroll systems, to employee benefits or other newer systems, he said.

Budlong's "Cobol, Just in Time" course includes his book, a Cobol compiler and software utilities that let students perform error checking on Cobol programs they write on their own PC. Also included is a follow-up book of "advanced Cobol tips and tricks and an additional study guide," he said.

Students can buy the book separately for $39.95. Since the book's publication in 1994, more than 9,000 copies have been sold. A second printing of 10,000 copies is under way, Budlong said. The course, which includes daily lesson plans and quizzes, is based on the book and was launched two months ago.

DOWN AND DIRTY

Colleen Lerian read Budlong's book while working as a sales clerk at Sports Chalet, a chain of sporting goods stores based in La Canada, Calif. At the time, she was also taking programming classes at night.

"The 21-day book will get you up to speed much quicker [than college classes]," Lerian said. Her college Cobol class lasted five months.

"It's down-and-dirty and teaches you what you need to know in the workplace. A lot of things they teach at the community college don't apply to the workplace," she said. For example, pseudo coding, the practice of sketching out a computer program in English first, was given a lot of attention in classes, she said. Budlong explains what it is and quickly moves on.

Today, Lerian works as a full-time Cobol programmer at Sports Chalet. She moved into the position after completing Budlong's at-home Cobol course and working as a data-entry clerk at the company.

Periodical postage paid at Framingham, Mass., and other mailing offices. Posted under Canadian International Publication agreement #0385697. Computerworld (ISSN 0010-4841) is published weekly: except a single combined issue for the last two weeks in December by Computerworld, Inc., 500 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171. Copyright 1997 by Computerworld, Inc. All rights reserved. Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed. Back issues, if available, may be purchased from the circulation department. Photocopy rights: permission to photocopy for internal or personal use is granted by Computerworld, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970. Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, Computerworld, Inc., 500 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: $3 a copy: U.S. — $48 a year; Canada — $110 a year; Central & So. America — $150 (surface) a year; Europe — $295 a year; all other countries — $295 a year. Subscriptions call toll free (800) 669-1002. POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Box 2044, Marion, OH 43305.

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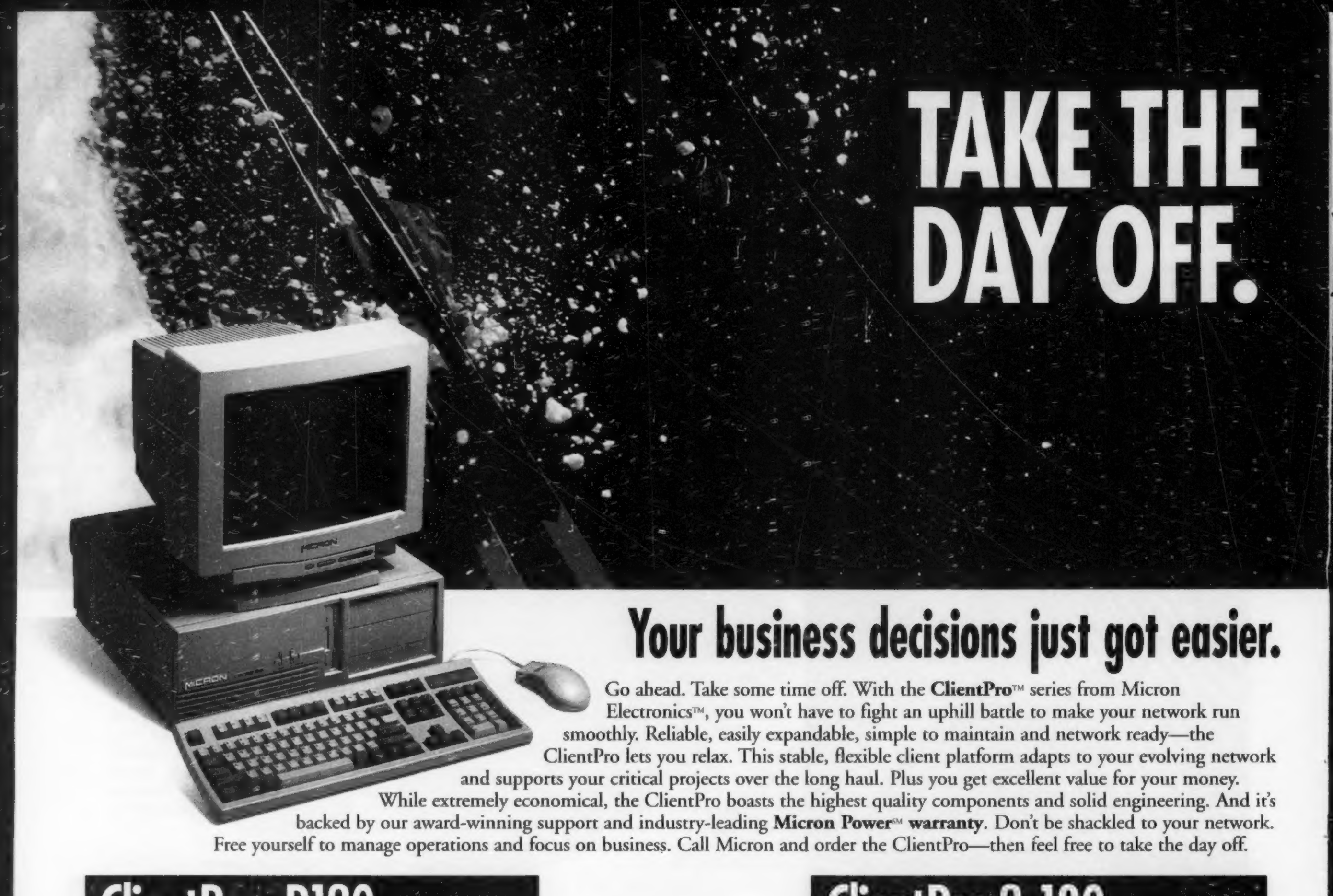

TAKE THE
DAY OFF.

Arm the firewall, here comes a 14-year-old boy

Steve Ulfelder

Well, at least the frogs are safe.

Everybody knows there is nothing meaner, more sadistic, uglier or less happy than a 14-year-old boy. When I was 14, the preferred activity was to torment frogs with firecrackers. Or, in a pinch, BB guns, tennis racquets — you name it. The only limit was the frog population, which dwindled perilously when too many bored, nasty boys gathered. An optimist may think the frogs smartened up and found some better hiding places.

Frogs must be living to a ripe old age these days because the modern 14-year-old boy has the World Wide Web on which to play.

Witness the recent hacks on government Web pages. In August, the U.S. Justice Department's home page was attacked. "Antigovernment diatribes, a swastika, a nude photo and other graffiti," we wrote, were posted on the site. In September, it was the CIA's turn. Vandals busted into the CIA home page, renamed it the "Central Stupidity Agency" and dropped in links to music and sex sites. These hackers reportedly ranged in age from 16 to 20. Spiritually, though, they were surely 14.

The U.S. Air Force is the latest victim in this game of Virtual Ring-and-Run. Its site was recently defaced with the now-familiar devices: Snickering messages, dirty pictures, weirdo links.

Of course, the hackers may be neither 14 nor boys. But they sure act like it. These raids are frequently called protests against the Communications Decency Act. I'm not buying it. This isn't Patrick Henry addressing Congress; this is Beavis addressing Butt-head (note that these latter two freedom fighters made their debut in *Frog Baseball*, which is what many boys play when they run out of firecrackers).

Remember when you were 14? I do. I protested everything — and nothing. I was furious at all the sociopolitical injustice in the world. I was equally furious that I had to tuck in my shirt. The whirling, smutty destructiveness of the recent hacks rings a bell. It lacks focus and purpose; it mixes legitimate points, half-baked rebellion and crude stupidity. It looks to me like the work of clever boys, not antigovernment terrorists.

And that's not necessarily good news for an IS department struggling to keep its site secure. Protesters, even terrorists, usually respond rationally to preventive strikes and countermeasures. It's reasonable to assume that if you make their job sufficiently difficult, they will go elsewhere to do their damage.

But have you ever tried to keep a 14-year-old boy outside a place he wanted to get into, or inside a place he wanted to get out of? It's nearly impossible. He is addled and hormone-crazed and angry at the world, and any effort to talk some sense into him merely increases his rage.

Users keep hoping the Internet will become what its creators hoped it would be: rational, measured, democratic with a small "D." But once in a while, a nasty group of boys remind the world that the 'net is really just one big frog pond. And the more prominent a site is, the more it looks like a slow old frog. After all, if the CIA can't secure its own home page, what are *your* chances?

Ulfelder is Computerworld*'s senior editor, In Depth. His Internet address is steve_ulfelder@cw.com.*

Too much trust is a bad thing

Charles Babcock

Features and functions are being added pell-mell to Internet browsers. But in one case, user empowerment has clearly outstripped IS' ability to maintain proper internal security.

The ability to recognize and accept digital certificates will be added to Netscape's Navigator and Microsoft's Internet Explorer early this year.

Digital certificates are a way to identify a sender and authorize a recipient — and only the intended user — to receive. The certificate is a kind of wrapper for a public key. If the certificate is recognized by the browser, it trusts the sender and activates the user's private key, which unlocks the message.

So far, so good. Digital certificates are a step toward business use of the Internet, and both Microsoft and Netscape are adding the capability as quickly as possible to push their browsers to the forefront of electronic commerce. But not all the infrastructure is in place to guarantee the certificates will be used as intended. Within an organization, there's no problem because IS can control the issuance of certificates.

But the main goal of moving to digital certificates is to encourage transactions with the outside world, and outside agents are going to authorize businesses on the 'net to start issuing certificates. I, for one, remain unconvinced that IS is going to know everything it needs to know about the public key holders — but users' browsers will trust and accept their certificates anyway.

At this stage, hardly anyone other than VeriSign, the established credit transaction company, is issuing certificates to businesses. A bank wishing to allow its customers to do business over the Internet gets a unique digital signature from VeriSign and then uses it in connections with customers. A customer browser, upon receiving the bank's certificate or public key, then uses its private key to unlock the message for the user.

There is confidence that VeriSign knows its customers, knows they're in the business they say they're in and has some sort of monitoring of the uses of public keys.

But like everything else on the Internet, this practice is going to expand geometrically as browser empowerment makes electronic commerce a competitive issue. Additional agents will spring up issuing digital certificates for a fee, and they will either have to invest heavily in investigating every request for a public key, or they will make an applicant jump through a series of hoops, issue the key and pray their procedures are adequate.

A sophisticated party could pose as a legitimate business to the certificate issuer and function in an entirely different manner once it gains a public key. The opportunity for theft, fraud and unauthorized solicitation of funds is immense.

Why does this danger exist in a supposed step toward more secure transactions? Because the browsers are being equipped with root keys so they can recognize the existing certificates on Internet browsers and enable their users to engage in a transaction.

The transaction is secure today, when we know a lot about the handful of parties that have been issued certificates. The danger springs up tomorrow, when more certificate-issuing authorities come into existence and many more parties have public keys.

Right now, fewer than 20 public keys exist. If that number shoots into the thousands in the next two years, the browsers will recognize all of them, too, and IS will have to ponder whether it knows any longer whom it is trusting.

Babcock is Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.*

The Back Page

alt.cw

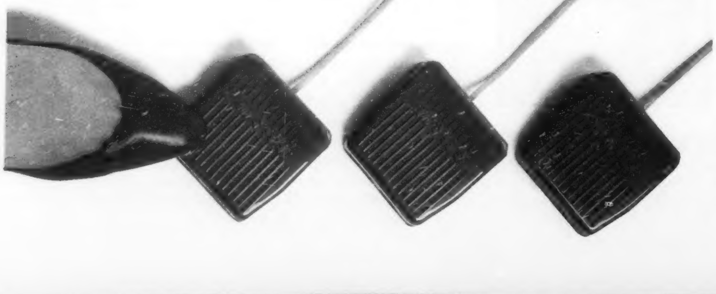
Dispatches & images from the fringes of the electronic frontier

Keystroke cops

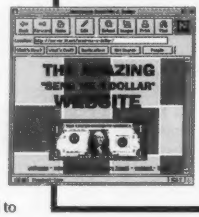
Caught a hacker? Michael R. Anderson, a forensic computer consultant and former investigator at the Internal Revenue Service, offered the following tips for handling computer evidence in the November 1996 issue of *Government Technology*:

- Don't run any programs on the computer in question without taking precautions, such as a bit-stream backup, because the computer may be rigged to destroy data. Even the simple DIR (directory) command can be rigged to reformat the hard drive.
- Don't let the owner help you operate the PC. It's like asking a thug to unload the gun found under his car seat. One defendant bragged that he was able to encrypt relevant files "right under the noses of the cops."
- Don't infect the computer evidence with a virus. That really destroys your credibility in court.
- Don't transport computer evidence in the trunk of a police car. It can be ruined by summer heat or the magnetic field created by an operating police radio.

Give your hands a break by using foot pedals for those pesky Ctrl, Alt and Shift keys or mouse clicks. The Step On It keyboard control pedals are offered by Bilbo Innovations in Sunnyvale, Calif.



P.T. BARNUM WOULD LOVE THIS



Who says you can't make money on the Web? The guy who runs the "Send Me A Dollar" Web site (server.tt.net/send-me-a-dollar/) has collected $198 in just 10 weeks. Yes, people from across the globe have mailed cash to this Los Angeles entrepreneur.

Human factors

Researchers at Carnegie Mellon University in Pittsburgh have developed software that monitors users' keystrokes and mouse clicks to spot flaws in a system's user interface. Called MetriStation, it uses statistical control and cognitive science techniques to produce a list of events that trouble users. "Even if a system's hardware and software underpinnings are completely reliable, errors at the user interface can cripple or destroy a mission," said Roy A. Maxion, a senior systems scientist.

CD-ROM USERS could learn something about storage from rural America. Hunt Manufacturing in Philadelphia has updated its MediaMate line of computer accessories by introducing the CD Silo. The vertical design lets users store up to 20 CD-ROMs safely and efficiently by eliminating the use of jewel cases and freeing up desk space. It costs $16.95.

Send your alt.cw contributions to **mbetts@cw.com**. If your item is used, you'll receive a cool T-shirt.

Inside Lines

Date bug gets a jump on 1997

Administrators ran into problems on New Year's Eve when key applications and network operating systems choked on a date-related bug. Apparently some programmers didn't properly adjust for the fact that 1996 was a leap year. So when LAN managers made changes on Tuesday, Dec. 31, to objects in Novell's NetWare 4.1 directory services (in DS module Version 5.73), the date turned to 970100 — Jan. 0, 1997, that is — instead of 961231.

The month that refuses to end

It seems that there's a bug in the Windows 3.1 Exchange client that incorrectly calculates the dates on both Dec. 30 and 31 of a leap year. On New Year's Eve, several Exchange users saw Dec. 178, 1997, instead of Dec. 31, 1996, when they opened their in-boxes.

Send PCs, drugs and money

That's "drugs" as in pharmaceuticals, fella. An IS director at one hospital last week complained that some users sneak in PCs by including them on purchase orders for drugs or other supplies purchased from medical distributors. That way, doctors and administrators can order what they like without submitting to pesky IS standards.

Low-tech solutions to high-tech problems

Ben Tartaglia, director of the International Disaster Recovery Association in Shrewsbury, Mass., has been following the recent deluge in the West with interest, having dealt with his own share of flooded telecom switch rooms. Tartaglia's surefire cure for water-damaged computer boards and equipment: "Use hair dryers. It's one of the first things you bring in. You don't want to melt the suckers. [Hair dryers] are a nice, gentle way to dry things out."

EMC to beef up mainframe storage products

EMC isn't resting on its laurels from another successful year in the mainframe storage market. Sources said the Hopkinton, Mass., firm will beef up its product line Jan. 14 by announcing new models of its 5100, 5200 and 5500 mainframe storage products. The upgrades also promise to more than double the speed at which data moves between the storage systems and the mainframe. The systems will also include 23G-byte head/disk assemblies.

Sun to launch StarFire superservers

Later this month Sun Microsystems will announce superservers based on technology purchased from Cray Research, sources close to the company said. Dubbed StarFire, the high-availability servers will handle 64 UltraSPARC 64-bit processors and can be partitioned into two systems within one box. Analysts said the announcement has been expected since Sun bought the Cray technology last May.

Compaq to serve boxes for smaller companies

Compaq plans to unveil a new business server for small and midsize corporations in mid-January. Compaq is already the No. 1 PC maker and provides servers and server management software.

Cisco to add 56K modems to remote servers

Cisco will begin implementing 56K bit/sec. modem technology in its remote access servers around midyear. The internetworking giant will first support the technology in its top-of-the-line AS5200 communications server with Microcom, Inc. modems based on Rockwell Semiconductor Corp. chips.

The migration path from Microsoft Mail to Exchange may be clear to Microsoft, but it certainly hasn't been smooth for some users. Incompatibilities between the Schedule+ components of Mail and Exchange continue to vex users. Some IS types are simply telling users that they can't share schedules between the messaging platforms during the migration to Exchange. But Computerworld's E-mail and voice mail are working just fine, so send news tips to news editor Patricia Keefe at patricia_keefe@cw.com or call (508) 820-8183.

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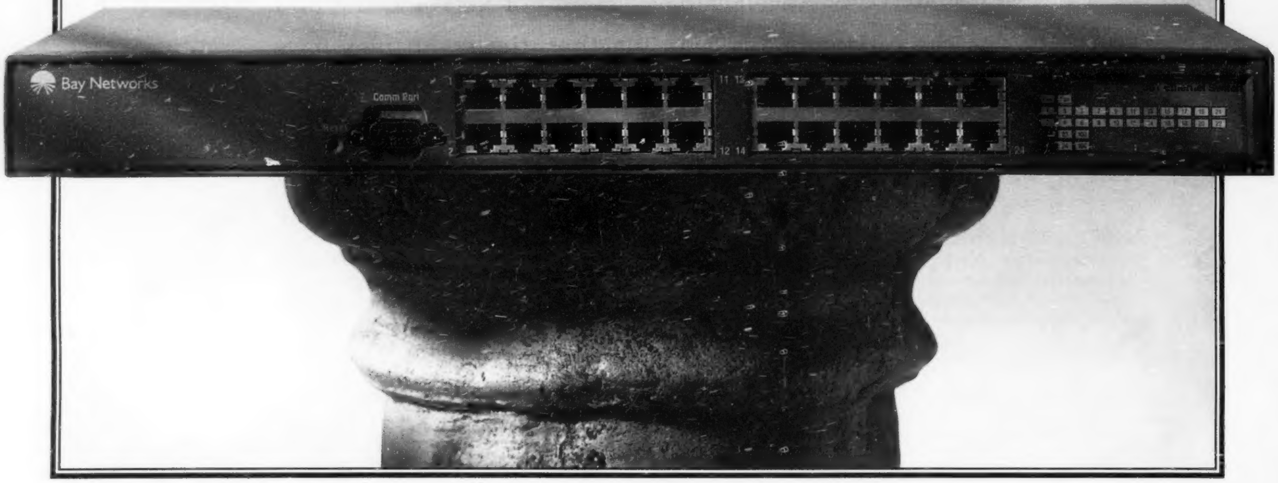

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